Attachment B
CRA Analysis

JOINT DECLARATION OF
STANLEY M. BESEN, STEVEN C. SALOP AND JOHN R. WOODBURY

FEBRUARY 8, 2005

Stanley M. Besen
Vice President
Charles River Associates

Steven C. Salop
Professor of Economics and Law
Georgetown University Law Center

Senior Consultant
Charles River Associates

John R. Woodbury
Vice President
Charles River Associates

Table of Contents

List of Tables

I. Introduction and Qualifications

1. This Declaration, which has been prepared at the request of Sprint Corporation (Sprint) and Nextel Communications, Inc. (Nextel), contains our preliminary analysis of the competitive impact of their proposed merger. Our qualifications for conducting this analysis are as follows:[1]

2. Stanley M. Besen is a Vice President at Charles River Associates, Washington, D.C. Dr. Besen has served as a Brookings Economic Policy Fellow, Office of Telecommunications Policy, Executive Office of the President; Co-director, Network Inquiry Special Staff, Federal Communications Commission; Coeditor, RAND Journal of Economics; and a Senior Economist, RAND Corporation. He currently serves as a member of the editorial board of Economics of Innovation and New Technology. Dr. Besen has taught at Rice University, where he was the Allyn M. and Gladys R. Cline Professor of Economics and Finance, Columbia University, where he was the visiting Henley Professor of Law and Business, and the Georgetown University Law Center, where he was Visiting Professor of Law and Economics. Dr. Besen has published widely on telecommunications economics and policy, intellectual property, and the economics of standards, and has consulted to many companies in the telecommunications and information industries. He holds a Ph.D. in Economics from Yale University.

3. Steven C. Salop is Professor of Economics and Law at the Georgetown University Law Center and a Senior Consultant with Charles River Associates. He is the author of numerous articles on industrial organization economics, antitrust law and policy, and the economic analysis of law. His scholarly articles examine a variety of economic and legal issues involving mergers, joint ventures and partial ownership interests, network markets, exclusionary conduct, and coordinated behavior. Professor Salop has worked on numerous telecommunications matters involving telephony, television program supply and distribution, and the Internet. He has been a visiting professor at MIT and the University of

[1] Our resumes are contained in Appendix 1 to the Declaration.

Pennsylvania and was previously Associate Director for Special Projects, Bureau of Economics, Federal Trade Commission. He holds a Ph.D. in Economics from Yale University.

4. John R. Woodbury is a Vice President at Charles River Associates, Washington, D.C. Dr. Woodbury is an expert in the economics of antitrust and regulation and has provided expert testimony, litigation support, and economic consulting services to a large number of business clients, including many in the telecommunications industry. In addition to having been a Brookings Economics Policy Fellow, he has held the following senior positions: Associate Director, Bureau of Economics and Assistant Director, Bureau of Consumer Protection, Federal Trade Commission; Economics Division Chief, Common Carrier Bureau, Federal Communications Commission; and Research Vice President, National Cable Television Association. He currently serves on the editorial board of the Antitrust Source. He holds a Ph.D. in Economics from Washington University (St. Louis).

5. The provision of wireless telecommunications services in the United States is highly competitive and will remain so after the merger of Sprint and Nextel. Although the two companies have been aggressive and innovative competitors, they continue to be handicapped by their relative lateness to the market and their disadvantages relative to their Regional Bell Operating Company competitors. The merger will offset some of these competitive disadvantages and make the combined company a more formidable competitor to Verizon Wireless and Cingular Wireless LLC (Cingular). The merger will reduce network construction and operating costs and will permit Sprint Nextel to offer innovative wireless services more rapidly, to more subscribers, and at lower cost than otherwise would be the case. At the same time, our analysis indicates that rival wireless carriers will continue to have the incentives and the necessary resources – including spectrum resources – to expand the number of subscribers that they would serve if the merged entity were to attempt to raise prices. As a result, the market will retain

the ability to deter price increases by the merged firm. For this reason, and others, coordinated price increases would also be deterred.

6. The remainder of this Declaration is organized as follows. We first examine the efficiency benefits of the merger. We then turn to the analysis of potential competitive harms. We begin by applying the initial structural screens employed by the Commission in its evaluation of the Cingular-AT&T Wireless transaction. This analysis utilizes subscriber share data acquired by Sprint and Nextel from Telephia and spectrum holding data compiled by Sprint and Nextel.[2] As part of this analysis, we note that Sprint Nextel will have more pro-competitive pricing incentives than its ILEC-affiliated wireless competitors, who have the incentive to take into account the impact of their conduct on intermodal competition and wireline profits. Because of this, the Commission should apply its initial structural screens under somewhat more permissive standards than it used in its review of Cingular-AT&T Wireless. We then evaluate the potential for competitive harms arising from unilateral and coordinated effects on competition in the provision of mobile telephony services and intermodal competition.

7. Based on our preliminary analysis, we conclude that the merger between Nextel and Sprint will likely benefit consumers without reducing the intensity of wireless competition. The merger is likely to increase competition. The merger is unlikely to increase Sprint Nextel's unilateral incentives to raise prices or increase the likelihood of coordinated behavior among the remaining wireless carriers. The same significant constraints on anticompetitive behavior that currently exist will also deter

[2] Telephia tracks information regarding the mobile telecommunications industry, including market share data for mobile service operators in major U.S. markets. This information is commercially available, and Sprint and Nextel enabled us to use these data for the limited purpose of the instant merger application. Because this information is proprietary to Telephia, however, the actual market data are redacted in the public version of the application.

anticompetitive price increases after the merger. Moreover, the substantial efficiencies that will result from the merger are pro-competitive and will benefit wireless customers.

II. The Efficiency Benefits of the Merger

8. In its review of the acquisition of AT&T Wireless by Cingular Wireless, the Commission considered "whether the combination... {was} likely to generate verifiable, merger-specific public interest benefits." In its analysis, the Commission asked "whether the combined entity will be able, and is likely, to pursue business strategies resulting in demonstrable and verifiable benefits to consumers that could not be pursued but for the combination."[3]

9. The Commission went on to emphasize that "the claimed benefit must be transaction- or merger-specific." This means that the claimed benefit "must be likely to be accomplished as a result of the merger but unlikely to be realized by other means that entail fewer anticompetitive effects."[4] Finally, the Commission stated that it "will more likely find marginal cost reductions to be cognizable than reductions in fixed cost."[5]

10. The merger of Sprint and Nextel will result in significant efficiencies. These efficiencies will directly benefit the current retail customers of the two companies as well as customers that the two companies serve indirectly. The efficiencies also will make the merged firm a stronger competitor, so that the subscribers of other carriers will benefit as well.

11. Many of these efficiencies are merger-specific. They could not be achieved, or are less likely to be achieved, or would not be achieved as quickly, without the merger. In addition, many of

---

[3] *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation For Consent to Transfer Licenses and Applications, Memorandum Opinion and Order,* 19 FCC Rcd 21522, ¶ 201 (2004) (hereinafter *Cingular-AT&T Wireless Order*).

[4] *Id.* ¶ 205.

[5] *Id.*

these efficiencies will reduce the marginal cost of serving subscribers or producing additional minutes of wireless service, and others will directly improve the quality of service received by wireless subscribers.

12. In this section, we discuss a number of the major efficiencies that Sprint and Nextel expect to achieve from the merger and explain why they are merger-specific and why they are likely to result in direct benefits to wireless subscribers. The efficiencies fall into the following major categories: (A) Improved Technology Development and Deployment; (B) Improved Network Coverage; (C) Cost Savings from Increasing the Proportion of "On-Network" Traffic; (D) Reduced Equipment Procurement Costs; (E) Reduced Backhaul Costs; and (F) Development of Services Using 2.5 GHz.

A. Improved Technology Development and Deployment

13. Because the merged entity will have a larger customer base than either of the merging firms, Sprint Nextel will undertake many types of investments, including investments in development and network deployment, which would be uneconomical for either Sprint or Nextel separately. Moreover, Sprint Nextel customers and competition will benefit in the near future from investments in new technologies and services that Sprint and Nextel have already undertaken, because each of the merging firms will be able to gain from investments that the other has already carried out. Although some of these benefits might be achievable through arrangements short of a merger – for example, through joint ventures or licensing arrangements – the ability to achieve them through these alternatives is likely to be more limited and realized more slowly, and the resulting benefits smaller, largely because of difficulties in structuring efficient teaming contracts or license arrangements between competing firms.

14. There are two general ways in which the merger will lead to these benefits. First, the merger permits Sprint and Nextel to avoid cost duplication. This clearly applies to new investments, but each of the merging parties also will benefit from avoiding the costs of duplicative development

activities. Second, many research and development efforts involve costs that are independent of the number of subscribers served. As a result of the merger, some of the projects that would have been uneconomical for either Sprint or Nextel to pursue separately due to high development costs would be economical for the combined firm. In addition, projects that would have been deferred until either Sprint or Nextel alone had gained a critical mass of customers can be pursued more quickly because Sprint Nextel will achieve that critical mass at an earlier date.

15. The most important example of these efficiencies is that the merger will permit the combined company to avoid the costs of independently developing and deploying nationwide next generation wireless networks. Nextel has not yet initiated construction of its network, while Sprint is in the process of deploying its CDMA EV-DO network. The merger will enable Sprint Nextel to enhance and expand the coverage of the CDMA network to serve customers who seek voice, high-performance push-to-talk features, and high-speed data performance. Sprint and Nextel estimate that they will save capital expenditures with a net present value of $4.8 billion after taking into account the necessary incremental investments in the CDMA network.[6]

16. In the absence of the merger, Sprint and Nextel would have had to continue to pursue separate development and deployment efforts. For example, Nextel had already planned to upgrade its network using either a version of the CDMA standard or another packet-switched mobile broadband technology. Sprint has already begun deploying EV-DO in a number of markets in its CDMA network. Both of these efforts would have permitted the carriers to offer new services to their subscribers. The merger will permit Sprint Nextel to offer more of these innovative services more quickly to more

[6] See Joint Declaration of Marc Montagner and Steve Nielsen for details on this and other estimates.

customers and at lower cost than would be the case if the merger did not occur.[7] In particular, Sprint Nextel will deploy CDMA EV-DO, including the more advanced EV-DO Rev. A, more rapidly and over a larger footprint than Sprint would have done on its own.

17. Sprint and Nextel have identified significant savings in technology development and deployment costs among the synergies that they expect from the merger. For example, many costs that Nextel would have had to incur to upgrade its network will be avoided as a result of the merger, since many of these costs have already been incurred by Sprint in connection with its effort to upgrade its own network. Similarly, Nextel has invested in a push-to-talk feature for CDMA by working with Qualcomm to develop QChat. Although some incremental costs will be incurred to add a high performance push-to-talk feature to the Sprint Nextel CDMA network and to provide a gateway to permit customers on the company's CDMA network to communicate through the push-to-talk feature with customers on the iDEN network, those development and deployment costs will be substantially smaller than those that the two companies would have incurred separately.

18. In addition to the efficiencies in network development and deployment, Sprint and Nextel also have identified efficiencies in their information technology and billing, customer care, and sales and marketing platforms. These include savings from avoiding duplication in the costs of developing and maintaining these platforms and savings because one of the merging parties can take advantage of improvements that have already been made by the other. These savings will reduce the costs of acquiring, retaining, and serving subscribers and will enable the merged firm to charge lower prices and

[7] For example, P.J. Howe, "A Tricky Marriage," *Boston Globe*, December 23, 2004, notes that "Nextel customers ...could get an offer for high-speed wireless service sooner than they otherwise would...." He then cites Nextel spokesman Russ Wilkerson as indicating "Soon after Sprint closes a merger with Nextel...the combined company would market to Nextel subscribers devices to offer wireless data connections for laptop computers over the Sprint network."

provide better service than could either of the merging companies on its own.[8] Sprint and Nextel have estimated that the net present value of the savings from these sources will be approximately $4.4 billion.

19. These benefits are merger-specific. Without the merger, it would take longer, and be more expensive, for Nextel to deploy a next generation network. Similarly, it would take longer, and be more expensive, for either Sprint or Nextel to achieve the same efficiencies that they can obtain by adopting superior information technology and billing, customer care, and sales and marketing platforms that the other has already developed. It also would be uneconomical for either Sprint or Nextel, on its own, to undertake certain new research and development projects, and to make certain new capital investments. Because Sprint and Nextel will be able to spread costs over a larger customer base than either company could individually, their incentives to invest in the development and deployment of new technologies and services will increase. As a result, the merged firm will be able to offer services that rely on superior, lower cost technologies.

20. Significantly, the same level of benefits cannot be achieved by the alternative of teaming arrangements short of merger, where Sprint and Nextel remain independent competitors. Teaming could, for example, involve arms-length exchanges of technology or a limited joint venture to achieve these goals. However, these alternatives would not lead to the same efficiencies.

21. Teaming would require Sprint and Nextel to agree on how to share the costs and benefits of their joint action. It also would require the parties to devise highly complex contracts to ensure that the scope of work for each party was well defined and to establish their respective financial commitments and other obligations. Finally, these contracts would have to be designed to facilitate efficient

[8] For example, an investment that either improves the quality of customer care, or reduces the incremental cost of providing care to a given customer, will reduce customer retention costs, and thus permit Sprint Nextel to lower the prices that it charges and give it the incentive to do so. An investment that lowers the incremental cost of billing a given customer has a similar effect.

information exchange and investment incentives without, at the same time, disclosing the trade secrets or intellectual property of either party. Otherwise the arrangements would be prone to attenuated incentives, free riding, and opportunistic behavior.

22. Such contracts are difficult to write, particularly where they involve R&D.[9] Virtually by definition, many key contingencies cannot be anticipated in contracts governing cooperative R&D activities among separate firms. In the end, any contract would be incomplete.[10] Moreover, even if all such contingencies could be anticipated, the resulting contract would have to be extraordinarily complex. Difficulties in crafting such contracts could lead the parties to delay or even abandon any attempt to cooperate. The proposed, but unconsummated, Broadband Radio Service (BRS) joint venture between Sprint and Nextel, discussed in more detail below, provides a good example of these difficulties.

23. Even where joint ventures or similar arrangements are pursued, there can be serious disputes between the parties. These disputes, in turn, can result in delays in product development or delivery and increased costs to customers. Thus, teaming arrangements cannot replicate the benefits of merger.

---

[9] As Scott Masten notes, "{B}ecause contingent performance is costly to stipulate and even more difficult for courts to administer, contracts typically contain few provisions and, as a result, tend to be inflexible mechanisms for governing exchange. The greater the complexity of the transaction and the level of uncertainty associated with it, the greater the likelihood of being bound to an inappropriate action, and hence the greater the implicit costs of contractual organization." *See* Scott E. Masten, "The Organization of Production: Evidence from the Aerospace Industry", Chapter 10 in Scott E. Masten, ed.: *Case Studies in Contracting and Organization* (New York: Oxford University Press, 1996); reprinted from *Journal of Law & Economics*, vol. 27 (October 1984), p. 190.

[10] For a more general discussion of the difficulties of creating optimal incentives to undertake specialized investments in the context of sequential contracts among contracting parties, see Oliver E. Williamson, *Markets and Hierarchies: Analysis and Antitrust Implications* (New York: Free Press, 1976), p. 94.

24. For example, suppose that Sprint and Nextel were to contract to permit Nextel customers to have access to a CDMA network more quickly by sharing Sprint's network and investing jointly to expand and upgrade that network. Such a venture would require Sprint and Nextel to share investment costs according to some formula. This formula would be difficult to negotiate because it would require the parties to agree about their relative benefits. Moreover, a formula that allocated network costs according to the parties' relative usage could have the effect of discouraging each from lowering its price in order to expand its output, since expansion would have the effect of increasing its share of the network costs. The parties may also disagree about the appropriate treatment of the intellectual property that is developed through the venture, for example, whether to maintain it as a trade secret, patent it for internal use, or license it to others.

25. Similar difficulties would arise if the parties were to attempt through contract to permit customers on their respective networks to communicate with one another through the push-to-talk feature. Such integration would provide greater competitive benefits to Sprint, which might make Nextel reluctant to share its technology without significant compensation. If that payment were to involve a per subscriber charge, prices could increase. If it were a lump sum charge, Nextel would have the incentive to overstate the value of its technologies and Sprint would have the incentive to understate Nextel's contributions. If the integration required further investments by Nextel and Sprint, each would prefer a technical solution that gave it a competitive advantage. There is no reason to think that teaming between Sprint and Nextel would be successful or timely in resolving these problems. Consequently, these benefits are merger-specific.

B. Improved Network Coverage

26. The merger will also result in better service quality for Sprint Nextel's wireless customers through a combination of improved signal strength, fewer dropped calls, and greater geographic

coverage. These benefits cannot be achieved as efficiently through either roaming agreements or sharing cell sites. Sprint Nextel will be able to reduce the number of overlapping cell sites while, at the same time, improving the quality of its service.[11]

27. Significantly, in a recent survey of departing Nextel customers, more than [ ] said that they dropped their Nextel service because of network performance and coverage problems.[12] A recent survey of departing Sprint customers obtained a similar result.[13] Because the merger will produce improvements in service, Sprint Nextel will be a stronger competitor. Moreover, expanded geographic coverage will permit Sprint Nextel to avoid some charges that Sprint customers currently incur when they roam into areas where there is no Sprint branded wireless service

28. By permitting the companies to deploy their sites more efficiently by eliminating overlap in their current service areas, the merger will also reduce the cost and improve the quality of service experienced by the subscribers of the combined company. The combined company plans to deploy significantly fewer new cell sites than were planned to be added by Sprint and Nextel in the absence of the merger, in part because a significant number of additional Sprint cell sites can be collocated on existing Nextel sites. This will result in savings in site development and leasing costs as well as operating expenses while improving CDMA network in-building coverage, overcoming weak signal coverage and coverage gaps, and adding capacity. In addition, Sprint and Nextel plan to consolidate a

---

[11] See Joint Declaration of Oliver Valente and Barry West (hereinafter Valente-West Declaration) ¶ 52 for a discussion of this issue.

[12] This is based on the percentage of surveyed ex-customers who said that network performance or coverage problems were their primary reason for terminating Nextel service. (The calculation excludes customers who were terminated by Nextel for non-payment.) The specific reasons given for network performance and coverage problems were: (a) dropped calls; (b) holes or dead spots in the network; (c) in-building coverage; (d) system outages, and (e) need to expand coverage.

[13] Approximately [ ] of exiting Sprint customers who were interviewed in the summer of 2004 cited network issues as one of the main reasons for leaving.

number of currently collocated Sprint sites into existing Nextel base station shelters and towers, thereby achieving additional cost reductions.

29. At the same time, the geographic coverage of the Sprint Nextel CDMA network will be greater than the area that would otherwise have been covered by Sprint's own CDMA network.[14] Instead of duplicating cell sites in the same geographic areas, the merged firm will deploy its CDMA network in areas currently served by Nextel that Sprint would not otherwise have served. The greater coverage and other improvements in service quality likely will reduce subscriber churn, thus reducing the cost incurred by Sprint Nextel in acquiring and retaining subscribers. This will give the merged company the incentive and ability to reduce the prices that it charges.

30. These benefits are merger-specific. Both Sprint and Nextel have attempted to expand their coverage through a combination of cell site sharing and roaming agreements, but these individual efforts are more costly, and produce fewer benefits, than can be achieved through the merger. Cell site sharing can overcome some of the inefficiencies of serving areas with small numbers of subscribers, but it is often logistically difficult and, in any event, it does not produce savings in equipment costs. We also understand that roaming often produces an inconsistent service experience, for example, by preventing subscribers from using certain features to which they have subscribed.[15]

31. Roaming agreements frequently involve substantial expenditures for roaming fees, in large measure because of imbalances in roaming usage among carriers. These costs are either passed on directly to roaming subscribers or included in the costs that carriers must recover from their entire

[14] The Commission has previously noted the consumer benefits from expanded network coverage. See, e.g., *Cingular-AT&T Wireless Order* ¶ 217.

[15] We understand that Sprint customers do not experience this degradation when they roam into areas served by Sprint affiliates and Nextel customers do not experience this degradation when they roam into areas served by Nextel Partners.

customer base. After the merger, Sprint Nextel will avoid some of the charges that Sprint currently incurs when its subscribers roam into areas in which it does not have coverage.[16] For example, in areas where Sprint currently pays roaming charges and where the combined firm will deploy its own CDMA network after the merger, these charges will be avoided. Sprint estimates that its per minute cost for a roaming call is more than 7 times its per-minute cost of a non-roaming call.

C. Cost Savings from Increasing the Proportion of "On-Network" Traffic

32. As the Sprint and Nextel networks are combined, the merger will permit Sprint Nextel to avoid some of the interconnection charges that they currently pay to ILECs for completing calls that transit between the separate Sprint and Nextel networks because those calls will now be completed through direct connection. Although Sprint Nextel will incur some incremental costs for this additional on-network traffic, the merger still will produce substantial savings as the proportion of traffic that remains on the Sprint Nextel network increases. Similarly, as the traffic on the two separate networks is combined, direct interconnection with other wireless carriers will (because of the greater combined volume) become economical where it is not today.[17]

33. Sprint has estimated that the per-minute cost of a call from one of its subscribers to someone off its network is approximately 19 percent greater than the per-minute cost of a call between two Sprint PCS subscribers. This gives some indication of the likely cost savings from this source. These cost savings will permit Sprint Nextel to lower the prices that it charges to subscribers and will give it the incentive to do so.

---

[16] The Commission credited such savings in its Order approving the Cingular-AT&T Wireless transaction. *Cingular-AT&T Wireless Order* ¶ 233. We understand that Sprint customers do not incur these costs when they roam into areas served by Sprint affiliates.

[17] Valente-West Declaration ¶ 22.

D. Reduced Equipment Procurement Costs

34. Nextel customers will benefit from lower handset costs as they migrate to the Sprint Nextel CDMA network. Wireless carriers charge less for handsets than their own procurement costs, and this subsidy represents a significant subscriber acquisition cost. The merger is expected to reduce handset procurement costs. As a result, Sprint Nextel will be able to reduce the prices that it charges to subscribers, either by reducing the price of monthly service, handsets, or both.

35. Motorola currently is Nextel's primary handset supplier.[18] In contrast, Sprint currently has four handset suppliers, which leads to more intensive competition than among the suppliers that serve Nextel.[19] Although Nextel might have been able to obtain some of these benefits if it had developed its own CDMA network, these benefits now will be available sooner for the current Nextel customers who choose the Sprint Nextel CDMA network.

36. In addition, Sprint Nextel will be able to obtain lower equipment costs, for both handsets and network infrastructure, than Sprint or Nextel could have achieved alone because Sprint Nextel will be able to offer larger orders over which suppliers can amortize their research and development costs, and because larger orders result in lower costs through increased supplier experience. As a result, equipment suppliers will have an incentive to offer lower handset and network infrastructure prices to the merged entity than they would to Sprint and Nextel absent the merger. Sprint Nextel subscribers will benefit from these lower costs.

37. These benefits of reduced procurement costs are merger-specific. Although Nextel customers eventually may have benefited from competition among equipment suppliers after Nextel

[18] See Valente-West Declaration ¶ 42.

[19] For an analysis of the effect of multiple supply sources on procurement costs see J.J. Anton and D.A. Yao, "Split Awards, Procurement, and Innovation," *Rand Journal of Economics*, Winter '89, pp. 538-552.

transitioned to CDMA or another next generation network, these benefits will be achieved more quickly as a result of the merger.

38. Finally, the larger equipment orders that will be placed by Sprint Nextel may increase competition among suppliers. This can occur because suppliers will have increased incentives to avoid being "shut out" of any given large long-term procurement. These cost savings from larger equipment orders also are merger-specific.

E. Reduced Backhaul Costs

39. Sprint Nextel customers will also benefit because a substantial proportion of Nextel's backhaul traffic will be carried on Sprint's wireline network after the merger instead of facilities that Nextel currently leases from other carriers. Nextel currently leases landline facilities from other carriers in order to connect its cell sites to its switches and to the facilities of local exchange carriers.[20] In contrast, a substantial portion of Sprint's traffic is carried on its own facilities, including the Metropolitan Area Networks that it maintains. The prices that Nextel pays for this backhaul exceed Sprint's incremental costs. Therefore, the merged firm expects to achieve significant cost savings by moving Nextel traffic to the Sprint network. The cost savings from using Sprint's local backhaul facilities are analogous to gains from eliminating "double marginalization" in a vertical merger.[21] Because these savings will affect the incremental costs incurred to carry current Nextel traffic, they can be expected to reduce the prices charged.

40. These benefits also are merger-specific. Although pricing inefficiencies sometimes can be eliminated in arms-length contracts, perhaps through the use of complex non-linear pricing systems, it often is difficult to do so in practice because usage is difficult to predict accurately. In this regard,

[20] Valente-West Declaration ¶ 20.

[21] That is, Sprint would, in effect, be providing an input to Nextel at marginal cost.

Nextel's current backhaul contracts do not levy a marginal price equal to cost, as evidenced by the cost-savings that the merger would achieve.

F. Improved Development of Services at 2.5 GHz

41. Sprint Nextel will face serious challenges to provide service over 2.5 GHz, including dealing with the propagation characteristics of the spectrum, choosing among still-developing technology options, assembling appropriate blocks of spectrum in the midst of the process of rebanding, designing a service that meets consumer demands, and confronting competition from other new services.[22] Sprint Nextel is more likely to succeed in meeting these challenges than either of the individual firms alone.

42. The geographic footprint of Sprint Nextel's 2.5 GHz rights will be larger than that covered by the rights of either firm alone and will allow 2.5 GHz service by the merged firm to reach more potential subscribers. By sharing development and deployment costs, Sprint Nextel will have greater incentives to undertake the development and deployment of innovative, high-speed multimedia wireless services than would Sprint and Nextel separately.

43. The greater reach of Sprint Nextel service also is likely to result in efficiencies in acquiring network and subscriber equipment. Such efficiencies would permit Sprint Nextel to offer 2.5 GHz services at lower prices than either firm could alone.

44. Finally, nearly nationwide Sprint Nextel service is likely to result in service that consumers find more valuable than service the individual companies could provide over more limited geographic areas, even if there were roaming agreements. Increasing the area served by a unified network will increase the value of service to some consumers if roaming would otherwise reduce the functionality of

[22] For more details, see the Joint Declaration of Todd Rowley and Robert Finch (hereinafter Rowley-Finch Declaration).

service. The larger network will also reduce the roaming charges paid by Sprint Nextel. In addition, because the Sprint Nextel network for 2.5 GHz service will be larger, suppliers of complementary services – e.g., applications suppliers – are likely to find it more attractive to supply Sprint Nextel than it would be to supply either of the merging parties. These factors will increase both the range and quality of the services that the merged entity will be able to offer to its subscribers and to reduce the cost of offering them.

45. It is unlikely the two companies could achieve similar efficiencies without merging. Sprint and Nextel previously discussed a joint venture to pool the BRS spectrum holdings of the two companies. However, the venture was never formed.[23] Both companies apparently were concerned about the governance of the venture, including how contract disputes would be resolved and how incentives for efficient behavior would be maintained as new information became available. In addition, differences in the wireless networks that the two companies would continue to maintain separately led to differences in their incentives with respect to the joint venture. Finally, both firms apparently were concerned about the effect of possible future material changes in the status of its partner on the viability of the joint venture.

46. These barriers to teaming are the types of transactions costs discussed earlier and provide a concrete example of the types of difficulties that cooperation short of merger entails. The merger of Sprint and Nextel will overcome these difficulties while, at the same time, achieving the benefits that the parties hoped to receive from the joint venture.

[23] For more details, see the Rowley-Finch Declaration.

III. Structural Screens for Competitive Effects Analysis

47. In this section, we define the relevant antitrust markets for evaluating this transaction. We then conduct an initial structural evaluation of the merger, similar to the one that the Commission performed in its review of the Cingular-AT&T Wireless transaction. We adjust the levels used in the Commission's structural screens to take into account a number of key structural differences between the Sprint-Nextel merger and the Cingular-AT&T Wireless combination, particularly the fact that Sprint and Nextel are not major ILECs. What these differences mean is that the Sprint-Nextel merger raises fewer competitive risks than did the Cingular-AT&T Wireless merger and, consequently, that the initial structural screens used by the Commission in Cingular-AT&T Wireless should be relaxed somewhat to account for these lower risks. In subsequent sections, we follow the approach used by the Commission in evaluating the Cingular-AT&T Wireless transaction by examining in greater depth those markets that are identified by the initial screens as requiring further competitive analysis.

A. The Relevant Product Market

48. In its *Cingular-AT&T Wireless Order*, the Commission concluded that the relevant wireless product market includes all mobile wireless services, both interconnected voice and data. In this Declaration, we follow the Commission and adopt this market definition. The Commission also concluded that, although there may be separate antitrust markets for enterprise (i.e., business, government, institutions) customers and residential (non-enterprise) customers, "enterprise customers tend to be high-volume users of mobile voice services {and} competition among carriers to attract and retain enterprise customers is likely to be relatively intense."[24] For this reason, the Commission concluded that the evaluation of a market that combined services to these two sets of customers would not result in any understatement of possible competitive harm to the market for enterprise services. In

[24] *Cingular-AT&T Wireless Order* ¶ 79.

this Declaration, we follow the Commission's approach of combining enterprise and residential service into a single market.

B. Competition in the Supply of Wholesale Wireless Services

49. One also might wish to consider whether to treat wholesale services, (i.e., the sale of wireless mobile services to entities that retail those services to final consumers) and retail services as separate markets. A number of suppliers purchase wholesale wireless services from Sprint and other carriers and then resell them to final consumers. Sprint's wholesale customers include Virgin Mobile and Qwest. Under these arrangements, network and feature functionality are provided by Sprint and the wholesale customer generally provides all other services (e.g., branding/marketing, billing, and customer care). We understand that final customers regard the retail sellers (i.e., wholesale purchasers) as their suppliers.

50. Some Sprint wholesale customers purchase minutes of use and data packets, often with a volume discount, and create and price their own retail packages. Others purchase pre-packaged bundles of voice and data at wholesale prices, which include a monthly recurring charge and a charge for "overage" (i.e., minutes that exceed the maximum in the package). Some wholesale customers operate nationally and attempt to serve all types of customers, while others operate in regional, demographic, or other market niches. For example, Qwest generally operates in its ILEC territory, and Virgin Mobile seeks young users who use pre-paid service.

51. It is our understanding that Sprint, Cingular, and Verizon Wireless together provide service to about 95 percent of all subscribers who are served through a wholesale intermediary, and that competition among these carriers is vigorous. We also understand that Nextel is not a supplier of wholesale services. Thus, the merger of Sprint and Nextel will not increase concentration among existing suppliers of wholesale wireless services. Although, in principle, Nextel could become a

supplier to wholesale customers at some point in the future, so could T-Mobile. Thus, even if Nextel were eliminated as a potential entrant, another potential entrant has sufficient capacity to absorb a large number of end users who are served through wholesale intermediaries.

52. Moreover, our analysis of competition indicates that other carriers generally have sufficient capacity to absorb not only those Sprint Nextel retail customers who would wish to switch carriers in response to a post-merger price increase, but also those customers whom Sprint currently serves through its wholesale customers. In fact, in calculating market shares, we conservatively have assigned to Sprint those retail customers whom Sprint indirectly serves through its wholesale customers.

53. In addition, some wholesale customers purchase the underlying service for a lump sum or fixed unit price under long-term contracts. A post-merger increase in retail prices would lead such wholesale customers to expand their retail output in response. These wholesale customers, who independently set their own retail prices, thus act as independent constraints on retail pricing by the underlying carriers.

54. Finally, the presence of retail competition constrains the prices that can be charged at wholesale. Because the merger of Sprint and Nextel will not harm retail wireless competition, it also will not harm wholesale competition.[25]

[25] It might be argued that, post-merger, the combined firm would have a heightened incentive to restrict sales to wholesale customers that compete downstream with the combined firm. However, if the merged firm lacks the ability to raise downstream prices even if it were to acquire all of the wholesale customers' subscribers, and if there is competition in the provision of wholesale services, then the merged firm would have no incentive to restrict those sales. Thus, for the same reasons that the merger is unlikely to produce higher wholesale prices as a result of reduced competition among wholesale suppliers, this type of vertical foreclosure is also unlikely.

C. The Relevant Geographic Market

55. In the *Cingular-AT&T Wireless Order*, the Commission concluded that the relevant geographic markets were local areas. In particular, the Commission evaluated subscriber shares within Component Economic Areas (CEAs), as defined by the Bureau of Economic Analysis of the Department of Commerce,[26] and Cellular Market Areas (CMAs), the geographic areas used by the Commission in its initial cellular licensing proceeding.

56. The Commission used two sources of subscriber data: Numbering Resource Utilization/Forecast (NRUF) data, which track telephone numbers used by all telecommunications carriers, including wireless carriers, and are collected "on a rate center area basis";[27] and billing data that were submitted by the six nationwide carriers "in response to a staff data request"[28] from which the Commission calculated the number of subscribers per zip code for each carrier. The Commission then aggregated these subscriber data to CEAs and CMAs. As discussed below, we use Telephia data to delineate the local markets in our analysis.[29]

57. The Commission concluded that there was enough local variation in mobile prices to reject the national market definition proposed by Cingular and AT&T Wireless.[30] In this Declaration, we follow the Commission and assume that the relevant geographic markets are local.[31]

---

[26] See K.P. Johnson, "Redefinition of the BEA Economic Areas," *Survey of Current Business*, February 1995, pp. 75-81.

[27] *Cingular-AT&T Wireless Order* ¶ 102. According to the Commission, rate centers are generally smaller than counties. However, a subscriber can be served by a rate center that is located in a county other than the one in which he resides.

[28] *Id.* ¶ 103.

[29] We did not have access to the NRUF and carrier billing data in preparing this Declaration.

[30] *Id.* ¶ 88.

[31] Although we adhere to the Commission's geographic market definition for purposes of this Declaration, we note that the five nationwide carriers advertise both prices and packages on a national

D. Applying the Commission's Initial Structural Screens

58. In the Cingular-AT&T Wireless matter, the Commission employed several initial "structural screens" to identify those local geographic areas (i.e., CEAs and CMAs) that warranted further detailed competitive analysis. There was no presumption that these markets would raise competitive concerns and, in fact, almost all of the markets that received more detailed analysis were ultimately found by the Commission to raise no such concerns.

59. The Commission used three structural screens in its initial analysis. The first screen identified for further analysis markets in which the post-merger Herfindahl-Hirschman Index ("HHI") would be 2800 or higher and the change in the HHI (i.e., the "Delta HHI") would be equal to or greater than 100 points. The second screen identified markets in which the change in the HHI would be 250 or higher, regardless of the post-merger HHI. The third screen identified markets where the merging parties would hold at least 70 MHz of wireless spectrum after the merger. The markets that were identified by these screens were subject to further analysis to determine whether there would be potential competitive harms if the transaction were approved without restrictions.[32]

60. Because we did not have access to the NRUF and carrier billing survey data used by the Commission in connection with the Cingular-AT&T Wireless proceeding, our analysis relies upon market share data purchased by Sprint and Nextel from Telephia.[33] We understand that the Telephia

---

level. This national strategy of these carriers could create competitive linkages across the local markets and constrain the ability of the carriers to discriminate among local markets.

[32] *Cingular-AT&T Wireless Order* ¶ 112.

[33] We understand that the Commission intends to employ data from NRUF and carrier billing records in its review of the Sprint-Nextel merger, and we would be interested in analyzing these data, as well.

data are widely used by wireless carriers in developing their competitive strategies.[34] We applied the Commission's initial structural screens to all of the local markets for which we have Telephia data.

61. The Telephia data provide estimates of market shares for wireless carriers in 235 local markets, each of which is a collection of counties. Market share data for 102 markets are based on consumer surveys regularly conducted by Telephia (Telephia Attitude and Behavior Survey (TABS)). Using a somewhat different methodology, Telephia estimates market shares for 133 ("snapshot") markets on an occasional basis. For these markets, Telephia determines market shares by using subscriber estimates that are obtained by electronically "querying" a panel of numbers and counting as subscribers those that return signaling information. Virtually all of the Telephia data are from 2004. (Data for six snapshot markets are from 2003.) In conducting our analysis, we conservatively included the shares of Sprint's affiliates and wholesale customers and Nextel Partners in the shares of Sprint and Nextel, respectively, which tends to overstate their market shares.

62. Table 1 lists the 235 Telephia local markets that we used in our analysis, detailing the subscriber shares of each carrier within those markets.[35] Table 2 shows the results of applying the Commission's two initial HHI-based structural screens to these markets. It lists those markets for which the post-merger HHI is 2800 or greater and for which the change in the HHI is 100 or greater. Table 2 also lists the additional markets for which the change in the HHI is 250 or greater.

63. Of the 235 Telephia markets, these screens identify 95 markets for further analysis. For example, San Angelo TX and Hammond LA would require more detailed evaluation because of high

[34] Although we have no reason to believe that there would be any significant difference between conclusions based upon the Telephia data and those based upon the NRUF data or carrier billing data, this view can only be confirmed after we have had the opportunity to analyze the additional databases.

[35] All tables appear in Appendix 2 to this Declaration.

post-merger HHIs (3380 and 5690, respectively). Gainesville FL is identified because the change in the HHI is 267.

64. The Commission's third initial structural screen identifies markets where the combined firm would have at least 70 MHz of spectrum, which represents about 35% of the spectrum available to provide CMRS in each market. The combined spectrum holdings of Sprint and Nextel would not reach 70 MHz in any of the Telephia markets that we examined, and most are well below that amount.[36] Thus, applying this screen does not add to the list of markets for which more detailed analysis is needed, according to the Commission's methodology.

E. Adjusting the Commission's Screens

65. Ninety-five Telephia markets would be identified for further competitive analysis if the structural screens used in the Cingular-AT&T Wireless transaction were applied to the Sprint-Nextel merger. However, the thresholds used by the Commission in the Cingular-AT&T Wireless transaction likely overstate the number of markets that deserve closer analysis in the Sprint-Nextel transaction. This is because the HHI levels in the screens used in Cingular-AT&T Wireless fail to account for several differences between the two mergers, differences that cause the competitive incentives of the merged firms in the two transactions to diverge.

66. First, Nextel is not an ILEC and the Sprint ILECs account for fewer than 5% of all switched access lines, all of which are intended to be spun off after the merger. By contrast, SBC and BellSouth, the owners of Cingular, account for more than 45% of all switched access lines. Second,

[36] Sprint and Nextel provided spectrum data to us on a BTA basis. We mapped the BTAs into Telephia markets using the county definitions of the Telephia markets and BTAs. Most Telephia markets were contained within one BTA. However, for those Telephia markets whose counties spanned more than one BTA, we matched the Telephia market with the most populated BTA. It should be understood in what follows that Telephia is the source of the subscriber market shares and Sprint and Nextel are the sources of the spectrum holdings data.

Sprint Nextel will generally have lower spectrum holdings than did Cingular-AT&T Wireless. Finally, the Commission may find that the Sprint-Nextel merger creates larger and more credible efficiency benefits than did the Cingular-AT&T Wireless transaction.

67. These three factors predictably lower the competitive risks raised by the Sprint-Nextel merger as compared to the Cingular-AT&T Wireless transaction. This suggests that the Commission should evaluate the Sprint-Nextel merger with more permissive initial structural screens.[37] In our analysis, we adjust the thresholds used in the screens to account for this lower risk. We discuss the three relevant risk factors in turn.

1. ILEC Integration

68. The most important differentiating risk factor is that the Cingular-AT&T Wireless transaction involved the acquisition of an independent wireless carrier by an entity owned by two major ILECs. This structural characteristic significantly increases the incentive to raise wireless prices and also raises intermodal competition issues that could lead to both higher wireline and wireless prices. In light of Sprint's far smaller presence as a local exchange carrier, and the fact that Sprint Nextel intends to spin off its limited ILEC holdings shortly after the merger is consummated, this factor is not a significant consideration in the Sprint-Nextel merger. This difference in incentives is the most important rationale for applying more relaxed structural screens to the Sprint-Nextel merger.

69. Relative to an independent wireless provider, an ILEC-affiliated wireless provider has less incentive to lower wireless prices in areas in which it is the local exchange carrier. This is because

[37] The fact that this merger reduces the number of national carriers from 5 to 4, and reduces by 1 the number of carriers in any local market where both Sprint and Nextel currently provide service, should not lead the Commission to consider reducing the HHI thresholds in the screens. A market with a HHI of (say) 2700 and a HHI delta of (say) 75 is not more prone to possible adverse competitive effects in this matter than in the Cingular-AT&T Wireless matter. Of course, the Commission's initial screens in this merger will identify more markets because the screens take the earlier transaction as given.

lower wireless prices encourage some wireline customers to switch to wireless service, which reduces wireline profits. Thus, an ILEC-affiliated wireless provider would only value the *incremental* profits associated with a wireline-to-wireless subscriber switch, whereas an unintegrated wireless provider would value the *total* profit from adding a new subscriber to its wireless service. This adverse intermodal pricing incentive effect arises even if substitution between wireless and wireline is limited mainly to secondary lines and the two products comprise separate relevant antitrust markets.[38] The magnitude of the impact on pricing incentives depends on the gains to the ILEC-affiliated wireless carrier from obtaining wireless customers from other wireless carriers as compared to the costs of "cannibalizing" its existing wireline customers.[39]

70. In addition, an ILEC that is integrated into, and has a substantial share of, wireless service, also has the incentive to raise *wireline* prices relative to an unintegrated ILEC. This is because the integrated ILEC recognizes that higher wireline prices would cause some substitution to its own wireless carrier. In the case of Cingular-AT&T Wireless, the Commission could reasonably have concluded that the merger would increase somewhat the incentives of BellSouth and SBC to raise wireline prices because the now-affiliated AT&T Wireless would capture some of the lost customers. The extent to

[38] Wireless services would not likely be such a potent constraint on wireline pricing that the antitrust market for wireline services would include wireless services under the market definition paradigm of the *Merger Guidelines*.

[39] ILEC-affiliated wireless carriers pay interconnection charges to themselves on in-region calls. This might appear to suggest they would earn a higher profit margin on a new subscription than does an independent wireless carrier, which would induce them to charge lower wireless prices. However, their incentives actually are more complex and likely push in the direction of higher prices. First, the ILEC-affiliated carrier would earn those same interconnection fees if instead the independent carrier obtained the customer, which eliminates any increased incentive to attempt to cannibalize the independent's subscribers. Second, as discussed in the text, the ILEC-affiliated carrier would want to charge relatively higher prices than would an independent, because it recognizes the opportunity cost of cannibalizing its own wireline subscribers. Thus, on balance, in a maturing wireless market, it is unlikely that the ILEC-affiliated wireless carrier would choose to set a lower price than would an otherwise comparably-situated independent.

which integrated ILECs can act on this wireline pricing incentive depends upon the effectiveness of regulatory oversight.

71. Finally, an ILEC that is integrated into wireless service has the incentive to degrade wireless rivals' access to its wireline network and to raise interconnection charges to competing wireless carriers, relative to an unintegrated ILEC. This exclusionary conduct would increase the integrated ILEC's profits. Here, too, the incentive and ability to engage in either type of exclusionary conduct depend upon the effectiveness of regulatory oversight.

72. This difference between the Cingular-AT&T Wireless transaction and the Sprint-Nextel merger implies that the Sprint-Nextel combination raises fewer competitive concerns. Although the Commission approved the Cingular-AT&T Wireless transaction, it viewed the loss of the independent (unintegrated) AT&T Wireless as cause for competitive concern. For example, the Commission observed that the record evidence "indicates that Cingular has developed and marketed many of its wireless products and services to complement—and specifically not to replace—residential wireline voice services."[40] The Commission also noted the clear contrast with AT&T's incentives: "unlike Cingular whose strategies are influenced by SBC's and BellSouth's concerns about its wireline revenues and access lines, {the pre-merger} AT&T Wireless is not likely to be concerned with the impact of its strategies on wireline revenues or access lines, except to the extent that they represent a potential source of new wireless customers. In fact, the documentary evidence indicates that AT&T Wireless sought to encourage mass market consumers to cut the {wireline} cord."[41] And the Commission recognized that the Cingular acquisition of AT&T Wireless would "further reduce Cingular's incentives to make

[40] *Cingular-AT&T Wireless Order* ¶ 244.

[41] *Id.* ¶ 243.

available wireless substitute offerings {for wireline}..." and may reduce AT&T's incentive to continue to market and develop these wireless substitutes.[42]

73. Of course, the reduced incentive to lower wireless prices by ILEC-affiliated wireless providers is not the only adverse consumer effect of the ILEC affiliation. In addition, at the margin, the incentive of the ILEC-affiliated wireless carrier to invest in wireless innovation and to deploy new services will also be reduced. For ILEC-affiliated wireless carriers, investing in innovations that make wireless a more attractive substitute for wireline service will tend to further cannibalize their ILEC's wireline offerings. As the Commission noted, "SBC and BellSouth influence the development of Cingular's products and services; that some of Cingular's products and services are focused on retaining/integrating with ... its corporate parents' wireline customers; and that SBC and BellSouth plan to use the acquisition of AT&T Wireless, to some degree, to further this goal."[43]

74. Because the Sprint-Nextel merger does not involve a significant ILEC affiliation, the Commission can safely apply more permissive initial structural screens to this transaction. Similarly, the Commission also should take the lack of ILEC affiliation into account in its more detailed market-by-market competitive effects analysis.

2. Spectrum Holdings

75. We understand that there are many geographic markets in which the combined Cingular-AT&T Wireless has substantial spectrum holdings. Cingular-AT&T Wireless has more than 60 MHz in 41 of the top 106 Telephia markets for which we have spectrum holdings data for major carriers. In contrast, Sprint Nextel will have more than 60 MHz in only 1 of the 106 markets. In none of the 235

[42] *Id.* ¶ 245.

[43] *Id.* ¶ 244.

Telephia markets do Sprint Nextel's spectrum holdings exceed 68 MHz, and most are well below this amount.

76. This evidence indicates that there would generally be *less* spectrum capacity available to competitors if Cingular-AT&T Wireless were to attempt to raise its prices after the merger than if Sprint Nextel were to attempt to do so. Because lower spectrum holdings create a reduced incentive to raise prices, the merger of Sprint and Nextel raises fewer competitive concerns.[44] We take spectrum shares into account in our more detailed analysis of markets that are identified by the initial screens. However, this risk factor also suggests that the Commission can safely apply more permissive structural screens at the initial stage of its analysis.

3. Efficiency Benefits

77. In any merger, the overall consumer impact depends on the relative magnitudes and likelihoods of anticompetitive harms and procompetitive benefits. The Commission did not give significant weight to Cingular-AT&T Wireless' cost-saving claims in balancing potential public interest harms and benefits.[45] It follows that if the Commission finds larger or more credible efficiency benefits in the Sprint-Nextel merger than it found in the Cingular-AT&T Wireless transaction, the Commission can be somewhat more permissive with respect to its competitive effects analysis. Just as the Commission demands more significant efficiencies when the likely competitive harms are more significant, it can similarly accept somewhat greater competitive risks where the efficiencies are larger or more credible. If the Commission credits the cost-savings for the merger claimed by Sprint and

[44] This is true even for markets that pass the Commission's initial spectrum screen since the amount by which they pass the screen also is relevant.

[45] *Cingular-AT&T Wireless Order* ¶ 232.

Nextel, that finding also would suggest that the Commission could safely apply more permissive initial structural screens.

F. Analysis Using Adjusted Levels for the Structural Screens

78. Because the Cingular-AT&T Wireless transaction generally provided a more risky balance of public interest benefits and harms than does the Sprint-Nextel merger, it is appropriate for the Commission to utilize somewhat more relaxed initial structural screens. We present results for several different degrees of modification, corresponding to various degrees of confidence in the importance of the three risk factors. In particular, we replace the Commission's HHI screens (i.e., a 2800 post-merger HHI plus a 100 HHI increase, or a 250 HHI increase for any post-merger HHI) with three alternative screens that increase these levels by 10%, 15%, or 20%.

79. Table 3 illustrates the 10%-adjusted HHI screen as applied to the 95 Telephia markets identified for further analysis by the Commission's initial HHI screens. If the Commission's screen levels are increased by 10% (i.e., a 3080 post-merger HHI plus a 110 HHI increase, or a 275 HHI increase for any post-merger HHI), the number of Telephia markets identified by the screens is reduced to 79. For example, the adjusted screen does not identify San Antonio for further analysis, which was identified using the Commission's screen because the HHI change was 259.

80. Table 4 lists the Telephia markets that are identified by the Commission's initial structural screen. The second column lists those markets that are identified by the 10%-adjusted screen. If the Commission's screen levels are increased by 15% (i.e., a 3220 post-merger HHI plus a 115 HHI increase, or a 287.5 HHI increase for any post-merger HHI), the number of Telephia markets identified for further analysis declines to 70. The 9 additional markets that are no longer identified are the ones below the line in the second column of the Table. Finally, if the Commission's screen levels are increased by 20% (i.e., a 3360 post-merger HHI plus a 120 HHI increase, or a 300 HHI increase for any

post-merger HHI), the number of Telephia markets identified by the screens falls to 60. The 10 additional markets that are no longer identified for further analysis are the ones below the line in the third column of the Table.

81. In its *Cingular-AT&T Wireless Order*, the Commission did not presume that the markets that were identified for further analysis by its initial screens were necessarily ones in which the Cingular-AT&T Wireless transaction would harm consumers. Instead, the Commission undertook more detailed competitive analysis of these markets. This is because the Commission stated that "a calculation of the HHI in a market is only the beginning of our analysis of the competitive effects of the merger, because its purpose is to eliminate from further analysis markets in which there is no potential for competitive harm."[46]

82. We follow the same basic methodology in this Declaration. For purposes of this Declaration, we conservatively use the 10% adjustment factor, so that our more detailed analysis focuses on the 79 markets identified by these adjusted initial screens. Our assumption that the subscribers of Nextel Partners, Sprint's affiliates, and Sprint's wholesale customers are included in the Sprint Nextel share is also conservative, i.e., this assumption has the effect of identifying more markets for further analysis than might in fact be warranted. However, even if the Commission were to choose not to make any adjustments to its structural screens, the Commission should still account for the Sprint-Nextel transaction's lack of ILEC affiliation, lower spectrum holdings, and efficiency benefits when balancing the competitive harms and consumer benefits of this transaction.

[46] *Id.* ¶ 184.

IV. Unilateral Effects Analysis

83. In its *Cingular-AT&T Wireless Order*, the Commission followed its initial structural analysis with a more detailed market-by-market evaluation of the potential for anticompetitive unilateral effects. The Commission focused on a number of factors that would be relevant to the evaluation of these effects. In this section, we first set out the framework for unilateral effects analysis. We then examine the key economic factors. These factors include the closeness of substitution between Sprint and Nextel, the potential for competitor repositioning and expansion, and the efficiency benefits of the merger.

A. Unilateral Effects Framework

84. In the *Cingular-AT&T Wireless Order*, the Commission concluded that wireless service is a differentiated product. It then followed the basic framework in the *Merger Guidelines* for analyzing unilateral effects in differentiated product markets. We also follow that framework. We examine the likelihood that the merged firm would gain the power and incentive to raise its post-merger price unilaterally, that is, even if it assumes that other competitors would not follow its price increase.

85. The most serious unilateral effects concerns arise when the merged firm becomes by far the largest firm in the market. In every Telephia market but one (Brownsville TX), Sprint Nextel's market share is under 50% (and [ ] in Brownsville).[47] In contrast, Cingular and AT&T Wireless had a combined subscriber share of more than 50% in 30 of the Telephia markets. These markets, and Cingular's shares, are listed in Table 5. For example, absent divestitures, Cingular would have achieved a subscriber share of [ ] in Tupelo MS, [ ] in Hammond LA, and [ ] in Telephia's Texas 6-Jack market. Moreover, many of the markets in which Cingular had a dominant market share were

[47] In this market, T-Mobile is the next-largest competitor, with a market share of [ ].

located in the ILEC regions of BellSouth and SBC. In over a third of these 30 markets, the Commission conditioned its approval of the Cingular-AT&T Wireless merger on spectrum or asset divestitures.

86. At least three key economic factors may deter unilateral price increases – low diversion ratios between the merging parties, the ability of rivals to reposition and expand output in response to a price increase, and the efficiencies of the merger. We discuss these three factors in turn.

B. Diversion Ratios and Closeness of Substitutes

87. The more distant substitutes are the products of the merging firms, the smaller is the post-merger incentive to raise price, other things equal. In the pre-merger market, a firm's profit-maximizing price is set at the level where the additional profits gained from the higher price charged to customers who remain with the firm are just equal to the profits lost from customers who switch to other firms, or purchase less. After the merger, the firm recaptures lost profits from the fraction of its lost customers who switch to the service of the now-acquired rival. This fraction is called the *diversion ratio* and affects the degree of profit recapture. As the diversion ratio decreases, the profit recapture rate decreases, and the incentive to raise price correspondingly declines.[48] As discussed below, there is no evidence that Sprint and Nextel are each other's next-best substitute. This suggests that the diversion ratio between them should be relatively small.

1. Customer focus

88. Sprint and Nextel do not share a common customer focus, which reduces the extent to which Sprint customers regard Nextel as a close substitute for Sprint, and similarly for Nextel's customers. Nextel's focus is much more skewed toward enterprise customers than is Sprint's. This

[48] As discussed earlier, if the wireless firm is owned by an ILEC, its profit recapture calculation will also include the diversion to and from its wireline operations, which can further raise its incentives to increase both wireless and wireline prices.

difference in focus also is reflected in part by the features that each promotes. Nextel is noted for its enterprise-friendly push-to-talk feature. In contrast, Sprint promotes color screen handsets, picture phones, data use, and the elimination of overages that are designed to appeal to non-enterprise customers.

2. Customer switching data

89. We have also reviewed data from Nextel and Sprint on customer switches following the introduction of wireless local number portability ("WLNP") and from exit surveys conducted by both merging parties. Evaluating subscriber switches by Nextel and Sprint subscribers can provide insight into the extent to which consumers regard Nextel and Sprint as close substitutes relative to other carriers. Although a single observation of switching behavior in a market may not always accurately measure long-term substitution behavior, switching patterns over a longer period of time can nonetheless be helpful in assessing whether two services are each other's closest substitutes. The data indicate that Sprint and Nextel are not each other's closest substitutes.

a) Number Portability Data

90. The WLNP data indicate that the subscriber switches between Sprint and Nextel are lower than those between each firm and their ILEC-affiliated competitors. Of the subscribers that left Nextel in 2004, only [ ] switched to Sprint. In contrast, [ ] of the lost Nextel subscribers switched to [ ] and [ ] switched to [ ] and [ ]. (See Table 6.)

91. Similarly, of the subscribers that left Sprint in 2004, only [ ] switched to Nextel. In contrast, [ ] of those Sprint subscribers switched to [ ] and [ ] switched to [ ] and [ ]. Thus, according to these data, Sprint and Nextel do not appear to be particularly close competitors.

92. This WLNP data can be disaggregated into residential and enterprise subscribers with the same result. In the residential segment, only [ ] of the lost Nextel subscribers switched to Sprint, versus [ ] to [ ] and [ ] to [ ] and [ ]. (See Table 7.) For Sprint's residential customers, only [ ] switched to Nextel versus [ ] to [ ] and [ ] to [ ] and [ ].

93. In the enterprise segment, only [ ] of the lost Nextel subscribers switched to Sprint, versus [ ] to [ ] and [ ] to [ ] and [ ]. (See Table 8.) For Sprint's exiting enterprise customers, only [ ] switched to Nextel versus [ ] to [ ] and [ ] to [ ] and [ ].

94. Using the WLNP data to predict diversion ratios is subject to several criticisms, some of which have been previously noted by the Commission.[49] First, the WLNP data involve all switches, not just those that arise in response to price increases. Second, because many subscribers have long-term contracts with their carriers, the originating carrier may no longer be the next-best alternative to the subscriber's new carrier by the time that the subscriber actually makes the switch. Third, the WLNP data contain two different measures of switching, the number of subscribers who switch away from a carrier ("port-out") and the number who switch to a carrier ("port-in"). There can be substantial differences between the two measures. Fourth, the WLNP data do not identify subscribers who reduce their wireless usage or drop their wireless subscriptions altogether. We discuss these criticisms briefly, in turn, and conclude that they do not undermine the use of these data for competitive analysis. That is, these criticisms do not imply that Sprint and Nextel should be regarded as especially close competitors, but rather that the porting data may have some limitations in assessing the closeness of substitution.

[49] *Cingular-AT&T Wireless Order* ¶ 131.

95. *Use of Historical Data on all Switches:* Aggregate historical switching data capture substitution from all causes, not just price changes. For example, suppose that subscribers care about quality as well as price. If one carrier reduces its quality, the resulting substitution pattern could be different from the substitution pattern that would occur if the carrier instead had raised its price.[50] However, because competition involves quality as well as price, substitution in response to quality differences still could be relevant to unilateral effects analysis.[51]

96. *Long-Term Contracts:* Historical switching data also can be potentially misleading when there are long-term contracts. The long-term contracts can slow down consumer switches and carrier rankings can change during the interim. This possibility suggests that porting data provide "noisy" measures of substitutability among carriers, but not necessarily that they produce biased measures.

97. *Multiple Diversion Measures:* The diversion ratio could be measured from data on switches away from (ports-out) or switches to (ports-in) a carrier. These two measures generally will differ because the total number of switches away from each of the other carriers will affect the percentage of a carrier's new subscribers who come from any particular carrier, not just the consumer preferences among the carriers. For this reason, substitution away from a carrier provides a better estimate of the diversion ratio than substitution to a carrier.

98. *Overstatement of Diversion Ratios:* Switching percentages may overstate actual diversion ratios. When a carrier raises its price, some subscribers will shift to other wireless carriers. Other dissatisfied customers instead stay with their current carrier but reduce their wireless usage. In addition,

---

[50] Only if all of the carrier's subscribers value the carriers on the basis of quality per dollar of cost, and all subscribers measure quality changes in the same way, would the price and quality diversion ratios be equal.

[51] If the Commission decides that unilateral effects analysis should be focused solely on price, then the use of quality-based diversions could bias the results, but the direction of any bias would be unclear.

some dissatisfied customers may decide to give up wireless service entirely instead of switching to a new wireless carrier. The estimated diversion ratio should take account of these factors. These factors imply that the total number of subscribers who switch away from a carrier is likely to understate the carrier's total volume loss.[52]

99. *Conclusion.* The WLNP data have limitations. Nonetheless, observing over a significant period of time that Nextel subscribers consistently tend to switch more to Cingular and Verizon Wireless than they do to Sprint provides evidence that Nextel customers regard Cingular and Verizon Wireless as better substitutes for Nextel than Sprint, so that Cingular and Verizon Wireless will have higher diversion ratios. Similar evidence suggests that Sprint customers also regard Cingular and Verizon Wireless as better substitutes than Nextel. In addition, the comparable results from the Nextel and Sprint exit surveys discussed next increase the confidence in these data for inferring consumer substitution patterns and relative diversion ratios.

b) Nextel's Exit Surveys

100. We also have reviewed data from exit surveys that Nextel conducted among its departing subscribers at the end of 2004. The exit survey results also indicate that Sprint's wireless service is not the next-best choice of most Nextel customers, although they may be subject to some of the same kinds of criticisms as the WLNP data.

[52] The impact of the overstatement of diversion ratios on gauging incentives would be smaller for an ILEC-affiliated wireless carrier. That carrier would take into account the substitution between wireless and wireline caused by price changes. For example, customers who are deciding whether to drop a wireline number for wireless, or what type of additional telephony service to obtain, would be more likely to stick with wireline if the carrier's wireless prices were higher. The ILEC-affiliated carrier would reckon the (marginal) impact on its wireline profits into its wireless pricing calculus, whereas the independent wireless carrier would not.

101. Nextel's survey asked departing customers to identify their replacement wireless provider if they have switched, or intend to switch, carriers. As reported in Table 9, only about [ ] of these departing customers identified Sprint. In contrast, [ ] identified [ ] as their replacement carrier and [ ] identified [ ]. The pattern was similar when the sample was split into enterprise and residential customers and into different regions. Only about [ ] of the enterprise customers and [ ] of the residential customers identified Sprint as the replacement carrier. [ ] and [ ] were the replacement carriers for the vast majority of exiting Nextel subscribers.

102. Nextel also tabulated the results for three separate regions of the country-North, South and West-with the same results. The percentage of exiting Nextel subscribers who identified Sprint as their replacement carrier was only [ ] in the North, [ ] in the South, and [ ] in the West.

103. Like the WLNP data, the use of the exit surveys to infer service substitutability is not problem-free. However, as with the WLNP data, there is no reason to believe that the data are biased. Therefore, these data can be useful as evidence for inferring the low likelihood of adverse unilateral effects in this matter.

c) Sprint's Exit Surveys

104. Sprint also conducts exit surveys of its departing customers. These surveys identified a subset of exiting customers who identified price as their main reason for leaving Sprint.[53] The Sprint survey results are consistent with the Nextel surveys and the WLNP data. As reported in Table 10, fewer than [ ] of departing Sprint customers who said that they switched on the basis of price moved

[53] This data set only includes those subscribers who switched to another major carrier, not customers who switched to regional carriers or dropped their wireless service entirely. Thus, the calculated diversion ratios would be overstated.

to Nextel, versus [ ] who switched to [ ] and [ ] who switched to [ ].

105. These data are not subject to the criticism that the results may reflect choices made in response to factors other than price changes. In addition, because the results from the Sprint exit surveys are consistent with the results from the WLNP data and the Nextel exit surveys, one can place greater confidence in the use of all of these data to predict low substitution between Sprint and Nextel.

106. A substantial fraction of all exiting Sprint customers also reported that they dropped wireless service altogether. For the summer of 2003, the apparent diversion to "no wireless service" (presumably, to wireline service only) was [ ]. In the summer of 2004, the corresponding figure was [ ]. These results suggest that wireline options apparently continue to play a significant role in the decisions of consumers in choosing wireless service. These results also suggest that the wireline cannibalization rate may be substantial and that the switching data overstate diversion ratios among wireless carriers.

C. Competitor Repositioning and Expansion

107. If competitors can easily reposition their products and expand their output in response to a competitor's unilateral price increase, that price increase will be less profitable. In the case of wireless mobile service, rivals could increase the number of cell sites and more closely match, for example, the calling plans of the merging firm. As discussed below, our analysis indicates that the ability of competitors to reposition and expand would significantly constrain the profitability of unilateral price increases by Sprint Nextel.

108. In its review of the Cingular-AT&T Wireless transaction, the Commission noted that a key factor in its competitive effects evaluation was the availability of spectrum that rival carriers might

use to absorb subscribers from the merged firm in the event of a post-merger price increase. In particular, for a sample of markets, the Commission asked "whether other carriers could absorb in the near term an increase in subscribers equal to 10 percent of the merged entity's subscribers in that market."[54]

109. Specifically, the Commission noted that "where a firm is already present in a market, has comparable service coverage, and has excess capacity relative to its current subscriber base, it should be able to adjust rates, plan features, handsets, advertising, etc., in the short run."[55] The Commission went on to state, "As a technical and operational matter, it will generally be feasible for firms to add customers quickly because excess capacity is often available and because non-trivial increases in the capacity to service customers can be realized rapidly in established cellular and PCS mobile radio systems."[56] This suggests that if Sprint Nextel were to attempt a unilateral price increase, rivals could respond by expanding their service and repositioning their subscriber plans to be more similar to those offered by Sprint Nextel, attracting customers away from Sprint Nextel, and thus reducing the price-increasing incentive of the merged firm.

110. Of course, the strength of the rivals' response to a unilateral price increase by Sprint Nextel depends importantly on whether rivals can expand the number of subscribers that they serve (e.g., by cell splitting or increasing coverage) without incurring any significant increase in incremental costs and without incurring any reduction in the quality of service. Determining whether sufficient spectrum capacity exists to permit the carriers to absorb the additional Sprint Nextel subscribers under

---

[54] *Cingular-AT&T Wireless Order* ¶ 136.

[55] *Id.* ¶ 134.

[56] *Id.* ¶ 135. The Commission also noted that "there are limits to repositioning. Firms may not be able to add quickly to their operating footprints, purchase additional spectrum if needed, secure tower siting permits, improve overall quality, or deploy a new technology." *Id.* ¶ 137.

these conditions is a complicated technical and economic matter, given the factors that affect spectrum efficiency, including the particular spectrum band that is being used, geographic conditions, and differences in technologies, among others.

111. There are many more markets in which Cingular-AT&T Wireless has a dominant share of subscribers than will Sprint Nextel. At the same time, Sprint Nextel's rivals will generally have more capacity than do the rivals of Cingular-AT&T Wireless. Sprint Nextel has more than 60 MHz of spectrum in only one of the 79 local markets that were identified for further analysis by the most conservative adjusted version (i.e., 10%-adjusted) of the Commission's structural screens. In contrast, Cingular-AT&T Wireless has more than 60 MHz in almost half of the markets (among the 79 markets) for which we have carrier-specific spectrum shares.[57]

112. In this Declaration, we have implemented, on a market-by-market basis, the Commission's suggestion to evaluate the number of additional subscribers that rivals could serve with their existing spectrum capacity.[58] We do not know precisely how the Commission conducted its own analysis. In this Declaration, we make the assumption that full capacity in a market is equal to the maximum number of subscriber share points that can be supported by 1 share point of spectrum among the major carriers. We use the carrier in each market with the largest subscriber share relative to its spectrum share to calculate this assumed maximum. We then apply that maximum to every firm in the market to determine the maximum subscriber share points that rivals of Sprint Nextel could support. These assumptions may be refined with subsequent analysis. To estimate the ability of the Sprint Nextel rivals to absorb additional share points, we then subtract the current share of the rivals from the (assumed) maximum supportable share points of the rivals.

---

[57] We only have spectrum shares for carriers other than Sprint and Nextel for a subset of the markets.

[58] *Cingular-AT&T Wireless Order* ¶ 136.

113. This difference thus estimates the ability of the rivals using existing spectrum to absorb additional subscribers, which we refer to as the rival's Subscriber Absorption Capacity (SAC). We then use the SAC measure for each carrier to determine whether rivals collectively have sufficient excess spectrum capacity to absorb 10% of Sprint Nextel subscribers, if those subscribers wished to switch carriers in response to a hypothetical post-merger unilateral price increase by the merged firm.

114. To illustrate our methodology, assume that Sprint Nextel's three rivals in a hypothetical market have the subscriber and spectrum shares listed in the example below. The largest ratio of subscriber share to spectrum share is for Carrier A, for which every share point of spectrum supports 1.67 subscriber share points. If we assume that this ratio represents full capacity utilization for all three rival carriers, then the other carriers can support maximum subscriber shares of 12.5% each (i.e., 1.67 times 7.5%). Because each of these rivals currently accounts for 5% of subscribers, each has a SAC equal to 7.5 share points, as shown in the last column of the example. Taken together, the total SAC for these competitors (i.e., 15%) exceeds 10% of Sprint Nextel's subscriber share in this illustrative example.

Subscriber Absorption Capacity (SAC): An Example

	Subscriber Share	Spectrum Share	Ratio	Maximum Subscriber Share	SAC
Sprint Nextel	65%	70%	.93	na	na
Carrier A	25%	15%	1.67	25%	0
Carrier B	5%	7.5%	0.67	12.5%	7.5%
Carrier C	5%	7.5%	0.67	12.5%	7.5%
	100%	100%			15.0%

115. We recognize that this methodology is subject to a number of caveats. First, we used the carrier in each market with the largest subscriber share relative to its spectrum share to calculate the assumed maximum capacity utilization. This assumption does not take into account possible differences in maximum spectrum utilization of various carriers. It also means that markets will differ significantly with respect to the assumed number of subscribers that can be served with a given amount of spectrum. Consequently, the results calculated for some markets may turn out to be implausible. Second, at this time, the spectrum share data for all carriers necessary to carry out this analysis is available to us only for the top 106 markets. For other markets, we only have data for the spectrum holdings of Sprint and Nextel. To deal with this data limitation, we calculated the maximum (full-capacity) subscriber share points per spectrum share point in these smaller markets based on the average of the maximums of the top 106 markets, which is a ratio of 1.77. We may be able to modify this assumption if additional data on spectrum holdings become available to us. Third, in those markets for which we did not have carrier-specific spectrum data, we assumed that a total of 200 MHz of spectrum is available in each of those markets, as described by the Commission in the *Cingular-AT&T Wireless Order*.[59]

116. The approach used here to measure excess spectrum capacity is conservative in several significant dimensions. First, the "full capacity" carrier is assumed to be incapable of absorbing *any* additional customers beyond the normal growth at stable prices, so that there is no subscriber capacity cushion available to that carrier. A subscriber capacity cushion would further deter post-merger price increases.

117. Second, in calculating available spectrum capacity, the SAC test excludes unassigned Auction 58 spectrum. The acquisition and use of additional spectrum by Sprint Nextel's competitors would further deter post-merger price increases. If a market fails to pass the SAC test, it would be

[59] *Id.* ¶ 81.

necessary to examine the results of Auction 58 to determine whether additional spectrum is being made available to Sprint Nextel's rivals in that market. In this regard, the Commission has noted that the ability to deter post-merger price increases may depend in part on the ability of rival carriers "to obtain access to additional spectrum suitable for the provision of mobile telephony services in the relevant market in a reasonably short period of time."[60] In evaluating the Cingular-AT&T Wireless transaction, the Commission considered the impact of additional spectrum from both Auction 58 and from spectrum that could be leased from NextWave.

118. Third, to the extent that wholesale customers of Sprint, Cingular, and Verizon Wireless have longer-term, fixed-price contracts for wireless service, these customers can expand their retail sales in the event of a post-merger price increase. Thus, these wholesale customers can act as a further constraint on the pricing of Sprint Nextel. However, in this Declaration, we do not take this factor into account in the SAC analysis.

119. Finally, even if a market fails to satisfy the SAC test, a unilateral price increase would not necessarily be profitable. If it were to impose a price increase, Sprint Nextel would lose subscribers to other carriers and wholesalers, as well as experience reduced sales to subscribers who cut their usage or drop wireless service altogether, such that the price increase could be unprofitable. Thus, the SAC test does not mark the end of the analysis.

120. Table 11 reports the results of our preliminary SAC analysis for the 79 markets that were identified by the adjusted levels of the structural screens. In all but one of these markets, other carriers have more than sufficient spectrum capacity to absorb 10% of Sprint Nextel subscribers. Even in the Brownsville TX market, where Sprint Nextel will have a subscriber share of [ ], the SAC methodology indicates that its rivals would have sufficient excess capacity to absorb an additional 87

[60] *Id.* ¶ 189.

share points, or [ ] times the [ ] share points that that they would need to absorb under the Commission's 10% output reduction assumption.

121. The only market that fails the SAC test for unilateral effects is Minneapolis. In that market, Sprint Nextel will have a subscriber share of [ ] and, as a result, rivals of the merged firm must have sufficient excess SAC to absorb [ ] share points in order to defeat a hypothetical unilateral price increase. However, according to the method used in our calculations, Sprint Nextel's rivals could absorb only 0.3 share points, which seems implausibly small in light of Sprint Nextel's modest leading market share.

122. The reason for this small SAC is that the maximum ratio of subscriber share to spectrum share in Minneapolis is only 1.09, one of the lowest ratios in the entire data set. Given the rapid wireless subscriber growth (i.e., 14% nationally), it seems implausible that there is so little room for expansion in Minneapolis and that the "full capacity" carrier does not have any subscriber capacity cushion beyond normal growth. After all, Sprint Nextel will have a subscriber share of less than [ ], which means that its competitors would need to expand their volumes by only about 4% each (e.g., from a [ ] share to a [ ] share) to close the [ ] share point gap.[61] The merged firm would face three other national competitors, each with more than a [ ] subscriber share, so making up this small gap seems highly likely.

123. Even if the current capacity in Minneapolis is found to be so limited that the gap cannot be absorbed with current spectrum capacity, the spectrum capacity in the market will grow. We understand that 40 MHz of additional spectrum will become available in Minneapolis as a result of Auction 58. This increased spectrum will further reduce any competitive concern if Sprint Nextel's competitors obtain some of it. Thus, following the Commission in accounting for excess spectrum

[61] That is, [ ] share points is about 4% of [ ] share points.

capacity as a post-merger competitive constraint, the SAC test using the data available to us for this Declaration suggests that there are unlikely to be unilateral-effects concerns.[62]

D. Efficiencies

124. Unilateral incentives to raise price are reduced if the merger generates significant variable cost reductions.[63] Such reductions would create incentives for the merged firm to reduce its price in order to sell more output. As we have discussed earlier, the merging parties believe that the Sprint-Nextel combination will create substantial synergies between the two firms and that many of these efficiencies will lead to pressure to reduce wireless prices.

125. In Section II of this Declaration, we reviewed the substantial efficiency benefits that the parties have estimated for this merger. These efficiencies have not been estimated on a market-by-market basis. Nonetheless, they provide a significant pro-competitive factor that should be taken into account by the Commission.

E. Conclusions on Unilateral Effects

126. This SAC analysis of competitor repositioning and expansion suggests that there are unlikely to be any markets for which a claim of a significant post-merger unilateral price increase would raise significant competitive concerns. The analysis of diversion ratios does not indicate that Sprint and Nextel are each other's closest competitors. The analysis of efficiencies also suggests that the merger would have pro-competitive tendencies that would deter unilateral price increases. Thus, based on our analysis to date, and subject to the qualifications discussed above regarding the data and assumptions

[62] We also evaluated the SAC for the 16 markets that were identified by the Commission screen but not the 10% adjusted screen. *Each* of the 16 markets has enough SAC to absorb 10% of the share of Sprint Nextel.

[63] This could also take the form of a reduction in the quality-adjusted price if the firm offers better products at the same price.

used in the SAC analysis, we conclude that there are unlikely to be adverse unilateral effects from this merger.

V. Coordinated Effects Analysis

127. In its *Cingular-AT&T Wireless Order*, the Commission also examined the potential for a wireless merger to facilitate anticompetitive coordinated effects, either through explicit or tacit coordination. In its analysis, the Commission considered a number of factors, including the number of firms in a market, transparency of information, firm and product homogeneity, differing positions on the technology path, the presence of mavericks, existing cooperative ventures, and carriers' excess capacity.

128. The Commission concluded that there was no evidence that the wireless competitors had restricted competition through coordinated interaction in specific markets, or that the Cingular-AT&T Wireless combination would make coordinated interaction more likely as a general matter. Indeed, the Commission noted as a general matter that it was "persuaded...that certain characteristics of the mobile telephony market environment, including firm heterogeneity and the presence of carriers with excess spectrum or network capacity, may continue to make it difficult for carriers first to reach terms of coordination and then effectively to detect and punish deviations in specific markets."[64]

129. Moreover, the Commission found it implausible that even a small subset of carriers would be able to reach an enforceable price agreement. In particular, the Commission noted that even though the shares of Verizon Wireless and the post-merger Cingular would become more similar, it was unlikely that even these two wireline-affiliated carriers would be able to coordinate. As the Commission stated, "since Verizon Wireless has already differentiated its brand from rival offerings based on network coverage and voice quality, Cingular may be less willing to agree to restrict competition on

[64] *Cingular-AT&T Wireless Order* ¶ 164.

other terms, such as promotions and advertising, which could offset or narrow this advantage."[65] In that paragraph, the Commission also cited differences in current and future technology positioning, equipment costs, and migration issues that would further complicate efforts to reach coordinated agreement even between the two ILEC-affiliated carriers.

130. In this section, we review the factors raised by the Commission in the context of the Sprint-Nextel transaction. We also examine the role of the efficiency benefits of the transaction and network effects.

131. *Number of Firms*: The merger of Sprint and Nextel will reduce the number of national competitors by one. However, there still will be four national competitors in most large markets and many smaller markets, as well as regional competitors.[66] Moreover, the reduction in the number of firms and increase in concentration is not by itself a sufficient basis for concluding that coordinated interaction is likely in a market like this with no history of coordination. As the Commission stressed in its review of the Cingular-AT&T Wireless transaction, "market share data are the beginning, not the end, of the competitive analysis."[67]

132. *Pricing Transparency:* The Commission observed that carriers regularly monitor their rivals' prices and packaging for residential customers, but that they have little information about rivals' pricing to enterprise customers.[68] This suggests that pricing coordination would be a greater concern for residential customers.

---

[65] *Id.* ¶ 157.

[66] *Id.* ¶ 154.

[67] *Id.* ¶ 96.

[68] *Id.* ¶ 154.

133. Although carriers monitor each other's prices, reaching and enforcing an agreement may be complicated by the complexity of pricing plans. For example, we understand that Nextel has at least 25 plans available to consumers and that, within each plan, there are numerous options involving such factors as the size and composition of the minutes in the "bucket" and the charges for overages. Moreover, we understand that numerous firms allow their employees (and their families) to purchase wireless services for their personal and family use through their employers. As a result, any post-merger incentive to raise residential prices may be blunted by the ability of many individuals to acquire wireless service through their employers. In this situation, the high degree of competition for enterprise customers also would constrain the prices charged to individuals when they purchase directly from wireless carriers.

134. *Firm and Product Homogeneity:* Significant asymmetries will remain after the merger of Sprint and Nextel. Products will remain differentiated. Sprint Nextel will have somewhat different incentives because of Nextel's higher share of enterprise customers. In addition, we have already discussed the significant incentive differences that flow from Verizon Wireless' and Cingular's ILEC affiliations. These differences in firm characteristics are obstacles to any post-merger effort to coordinate pricing.

135. *Technology Development and Competition:* Coordinated interaction is less likely to succeed in wireless telephony because of the dynamic nature of the market. The wireless market has been, and continues to be, in the process of technological change as carriers deploy 2.5G and 3G services, and the robustness of consumer demand for these services is uncertain. In addition, the differences in the positioning of the firms on their technology paths will remain substantial following the merger and will continue to complicate pricing agreement and enforcement. Finally, investments in

these markets are quite lumpy. This is the kind of dynamic market environment that is not conducive to successful tacit coordination.

136. *Network Effects:* The wireless market also is subject to network effects because of the lower costs to the carrier of on-net calls and the customer benefits of push-to-talk calls.[69] The desire to create network effects increases the benefits of deviating from a coordinated outcome. Although the Commission suggests that network effects have not had a significant impact so far, they are yet another factor that would complicate coordination.[70]

137. *Mavericks:* The Commission noted in its review of the Cingular-AT&T Wireless transaction that regional carriers would remain potential mavericks.[71] In addition, the Commission concluded that "no single nationwide carrier is uniquely positioned to be a maverick."[72] Indeed, it concluded that even Verizon Wireless and Cingular may be mavericks in some markets.[73] These same points will remain equally valid after the merger of Sprint and Nextel. Thus, this merger does not involve the acquisition of a unique maverick.

138. *Cooperative Ventures:* The Commission raised concerns about cross-ownership arrangements.[74] These concerns would not appear to apply to the Sprint-Nextel merger. In addition, we have counted Sprint affiliates and Nextel Partners as part of the merged firm in our analysis.

---

[69] "Network effects arise when the value of a product increases with the number of consumers who purchase it." *Id.* ¶ 143.

[70] *Id.* ¶ 145.

[71] *Id.* ¶ 161.

[72] *Id.* ¶ 162.

[73] *Id.* ¶ 162.

[74] *Id.* ¶ 163.

139. *Efficiencies:* The efficiencies created by the Sprint-Nextel merger will make coordinated interaction less likely. By reducing its costs, the newly merged firm will have a greater incentive to deviate from a proposed coordinated outcome and expand its output instead.

140. *Spectrum Capacity:* Attempts to coordinate are less likely to succeed if rivals have sufficient capacity to expand without any significant increase in incremental costs or reduction in the quality of service. The availability of that capacity would increase incentives to defect from the terms of coordination. It also would permit firms that are not part of the coordinating group to reposition and expand in response to price increases and output restrictions by the coordinating group. As the Commission noted, "a rival carrier may have a strong incentive to deviate from the terms of coordination if it has excess spectrum and (or) network capacity relative to the traffic generated by its existing customer base."[75]

141. We have already discussed the SAC algorithm for measuring the ability of carriers to absorb additional subscribers and applied it to the unilateral effects analysis. In this section, we employ the SAC methodology to evaluate the potential for successful coordination between the two leading firms in a market.[76] We estimate whether the remaining smaller firms, who are not part of the assumed coordinating group, will have sufficient SAC to absorb 10% of the *combined* shares of the two leading firms, if they were to attempt a coordinated price increase. The SAC analysis of coordinated effects is subject to the same caveats and data limitations discussed with respect to unilateral effects.

142. We have applied the SAC methodology to the subset of the 79 Telephia markets identified by the adjusted structural screen where Sprint Nextel would be one of the two leading firms.

---

[75] *Id.* ¶ 187.

[76] As noted earlier with respect to unilateral effects, failure to satisfy the SAC test does not necessarily mean that a coordinated price increase would be profitable.

This identifies a total of 61 markets.[77] The combined subscriber share of the two leading carriers in these markets ranges from a low of [ ] for Sarasota FL to a high of [ ] in Wilson TX. Although the hypothetical coordinating firms likely would not be able to reach agreement unless both of their market shares are high, we applied the algorithm to all of these markets, not just those that satisfied some particular market share threshold. The results of our calculations appear in Table 12.[78]

143. To illustrate the application of the SAC methodology to coordination by the two leading firms, consider the example of St. Louis. In this market, the combined share of Sprint Nextel and Cingular-AT&T Wireless (the other leading firm) will be [ ]. Using the Commission's 10% output reduction standard, the issue is whether the other smaller carriers have sufficient SAC to absorb [ ] share points in the event of a hypothetical coordinated price increase by these two firms. The SAC methodology described earlier suggests that the remaining carriers could absorb an additional [ ] share points, or about 2.8 times the capacity required to absorb the [ ] share point output reduction (i.e., [ ]/[ ]). Therefore, the SAC algorithm suggests that pricing coordination will be unlikely to succeed in the St. Louis market in the face of repositioning and expansion by rivals.

144. The SAC methodology for coordinated effects indicates that rivals are able to absorb the requisite share point output reduction in 55 of the 61 markets that we analyzed. In only six markets, Hammond LA, Kansas City, Minneapolis, Houston, Chicago, and Wilson TX is this not the case.

---

[77] Whether or not the Commission chooses to use our adjustments to its structural screens, the Commission's competitive analysis should still recognize the differences between this transaction and the Cingular-AT&T Wireless transaction in its public interest evaluation, including the differences resulting from the lack of ILEC affiliation, the more credible efficiency benefits, and the differences in spectrum holdings.

[78] Note that we have spectrum data for the leading carriers only for the top 106 markets. For others, we have only the spectrum holdings of Sprint and Nextel. In markets that were identified by our 10% adjusted screen, we assume that the non-Sprint Nextel member of the two leading firm group has a spectrum share proportional to its subscriber share. This assumption may lead to inaccurate results in some cases.

However, there are several reasons why there are unlikely to be coordinated effects problems even in these six markets.

145. *Minneapolis:* We have already discussed Minneapolis in the unilateral effects section. We note here that the assumptions used for applying the SAC methodology to the potential for coordination between Sprint Nextel and Verizon, the other leading firm in Minneapolis, produce the implausible result that the estimated SAC is negative. Interpreted literally, this would mean that the rivals in these two markets lack enough spectrum even to support the subscriber shares that they currently have. This result occurs because the maximum ratio of subscriber share to spectrum share estimated for Minneapolis is only 1.09, far lower than the ratio found for many large markets.[79] If even a modestly higher ratio (of 1.28) had been applied to Minneapolis, the resulting SAC would have been sufficient to absorb all the necessary subscribers. Similarly, if even a small subscriber cushion had been assumed, the same result would be obtained.

146. Moreover, further economic analysis of Minneapolis suggests that there would not be a coordinated effects issue in this market. First, additional spectrum will be added in Minneapolis as a result of Auction 58. This additional spectrum can increase the SAC of smaller rivals and increase their ability to deter post-merger coordinated price increases. For example, if rivals obtain only 11 MHz of the 40 MHz being auctioned for Minneapolis, that alone will be sufficient to absorb the requisite subscriber share. Second, the Commission expressed its greatest concern about coordinated effects in markets with only two competitors.[80] In Minneapolis, all four national firms will be present after the Sprint-Nextel merger, all of which will have subscriber shares of at least [ ]. In fact, Sprint Nextel and Verizon Wireless will have a combined share of only [ ]. This means that the smaller non-

[79] In this regard, we note that the data set for Minneapolis was incomplete. Some rival carriers have subscriber shares but had no reported spectrum holdings in the data set that we used.

[80] *Cingular-AT&T Wireless Order* ¶ 191.

coordinating firms already supply over [ ] of subscribers. This factor would make attempted coordination between the two leading firms less likely to succeed.

147. *Kansas City:* A similar economic analysis applies to this market. First, additional spectrum will be added in Kansas City in Auction 58. In fact, if rivals obtain only 11 MHz of the 30 MHz being offered in Kansas City, that alone would be sufficient to absorb 10 percent of the subscribers of the two leading firms. Second, in Kansas City, Sprint Nextel and Cingular will have a combined share of only [ ]. This means that non-coordinating firms currently have a combined share of almost [ ] of subscribers, which will make coordination between the two leading firms less likely to succeed. In addition, all four national firms will be present in Kansas City and each will have a subscriber share of at least [ ] after the merger.

148. *Chicago:* No additional spectrum will be added in Chicago in Auction 58. However, in Chicago, Sprint Nextel and Cingular will have a combined share of only [ ]. This means that non-coordinating firms already supply more than [ ] of subscribers, which would make attempted coordination between the two leading firms less likely to succeed. In terms of number of firms, there will be five firms present in Chicago with subscriber shares of at least [ ] after the merger, the four national firms plus US Cellular, which has a market share of [ ].

149. *Houston:* As in the case of Minneapolis, we estimated a negative value for SAC, which suggests that the maximum ratio of subscriber share to spectrum share, 1.18, used in the SAC calculation, may be too low. If that ratio had been only modestly higher (at 1.36), rivals would have sufficient SAC to absorb 10% of the subscribers of the two leading firms. Beyond the SAC test, similar economic analysis applies to this market. First, additional spectrum will be added in Houston in Auction 58. In fact, if rivals obtain 12 MHz of the 20 MHz being offered in Houston, this alone would be sufficient to absorb all the necessary subscribers. Second, in Houston, Sprint Nextel and Cingular will

have a combined share of only [ ]. This means that non-coordinating firms already supply more than [ ] of the subscriber share, which would make coordination between the two leading firms less likely to succeed. In Houston, all four national firms will be present after the merger, each with a share of at least [ ].

150. *Wilson TX and Hammond LA:* The SAC results for both Wilson TX and Hammond LA are distorted by the data limitations we faced. The assumptions that we made result in a significant overestimate of Cingular-AT&T Wireless' combined spectrum share, which were estimated to be in excess of 80 MHz in both markets. Once those overestimates are corrected, both of these small markets pass the SAC test by a substantial margin.[81]

151. Based on the Commission's methodology and our SAC analysis to date, there are unlikely to be coordinated effects problems resulting from this merger. In the 55 of the 61 Telephia markets where Sprint Nextel would be one of the two leading firms, the SAC test indicated that rival carriers had sufficient capacity to absorb at least 10 percent of the subscribers of the two leading firms, if those firms were to attempt to raise their prices after the merger. For the four large markets for which this is not the case, other economic factors, together with the use of assumptions that are more

[81] As discussed earlier, we do not know the spectrum holdings of any carriers other than Sprint Nextel for the Telephia markets outside the top 106 markets. Therefore, we used information from these larger markets to estimate the "full capacity" subscriber share/spectrum share ratio. In addition, for the coordinated effects analysis for these smaller markets, we had to estimate the spectrum holdings of the other leading firm. To do so, we assigned the spectrum share not held by Sprint Nextel to the other leading carrier in proportion to its subscriber share in that market. This methodology leads to an overestimate of the spectrum holdings of Cingular-AT&T Wireless, which are found to exceed 80 MHz using this assignment methodology. We understand that Cingular-AT&T Wireless will not have more than 80 MHz in any market after the merger. *Cingular-AT&T Order,* note 103. Assuming, therefore, that Cingular has no more than 80 MHz in these two markets, the SAC in Wilson is more than 6 times the amount required to absorb 10% of the combined shares of the two leading carriers ([ ] share points). In Hammond, the assumption results in a SAC that is 5 times the amount necessary to absorb 10% of the combined shares of the two leading firms in this market (i.e., [ ] share points). It is possible that a similar overestimate would apply to some other markets in which Sprint Nextel is not one of the two leading firms.

appropriate to these markets, indicate that there are unlikely to be significant coordinated effects issues. Finally, in Hammond LA and Wilson TX, the initial SAC test was distorted by incomplete spectrum holdings data. After correcting for this distortion, however, these two small markets passed the SAC test.[82]

VI. Intermodal Competition

152. In its *Cingular-AT&T Wireless Order*, the Commission raised concerns about the impact of that merger on intermodal competition.[83] In this Declaration, we have already discussed the fact that a wireless carrier that is owned by a significant ILEC has the incentive to charge higher wireless and wireline prices. We also have discussed the fact that the integrated ILEC has the incentive to charge higher access prices and to degrade the access that it offers to its local exchange network to wireless competitors. Integrated firms also have potential marketing advantages from their ability to bundle wireline and wireless services.

153. In its analysis of the Cingular-AT&T Wireless transaction, the Commission concluded that the potential public interest harms from a loss in intermodal competition are currently quite limited

[82] We also examined those 16 Telephia markets that were identified by the Commission's screen, but not by our 10% adjusted screen. Sprint Nextel would be one of the two leading firms in only 5 of these markets. In only 2 of these 5 markets does our estimate of the SAC indicate that rivals would have insufficient capacity to absorb 10% of the subscribers of the two leading firms. In Tampa, one of these two markets, the combined shares of the two leading firms is less than [ ] and there will be 5 firms with market shares of at least [ ]. In addition, the SAC calculation is negative, highlighting the limitations of this approach discussed earlier. In San Antonio, the maximum ratio of subscriber share to spectrum share is just above unity (1.06), which, like Minneapolis, should be viewed as implausibly low. If that ratio were raised to only 1.15, the rivals of the two leading firms would have sufficient spectrum capacity to absorb 10% of the combined share of the two leading firms. In addition, we understand that 30 MHz of spectrum in San Antonio will be made available in Auction 58. If non-coordinating carriers would obtain at least 12 MHz in these auctions, that alone would be sufficient for them to absorb the requisite number of subscribers of the two leading carriers. In all of these markets, we only considered coordination between the two leading firms, because coordination among more than two firms would face even greater obstacles. See *Cingular-AT&T Wireless Order* ¶ 191.

[83] *Cingular-AT&T Wireless Order* ¶¶ 237-246.

and would be outweighed by public interest benefits.[84] However, it cautioned that it would continue to monitor the market to ensure that independent wireless competitors and intermodal competition would not be impeded.[85] In this regard, the merger of Sprint and Nextel should facilitate, rather than diminish, intermodal competition by increasing the ability of these independent wireless competitors to reduce their costs, improve their product offerings, and compete more effectively.

VII. Conclusions

154. The merger of Sprint and Nextel is unlikely to raise significant competitive concerns. The merger will produce a number of efficiencies that will reduce the cost of serving additional subscribers or producing extra minutes of service, and improve the quality of the service that is offered by Sprint Nextel. Thus, these efficiencies will directly benefit wireless subscribers and increase wireless competition. Many of these efficiencies likely would not have occurred absent the merger or would not have occurred as quickly. Therefore, they are merger-specific.

155. The initial structural screens used by the Commission for identifying markets for further analysis in the Cingular-AT&T Wireless transaction would not identify most of the local geographic markets that appear in the Telephia data that we have analyzed. Even fewer Telephia markets would be identified if the structural screens were adjusted to reflect significant differences between the two transactions, especially the fact that Sprint Nextel will not be affiliated with one of the leading local exchange carriers.

156. In the local markets where more detailed competitive analysis would be required by the structural screens, there seems little likelihood that the merger will give Sprint Nextel an incentive to raise prices unilaterally. Sprint and Nextel do not appear to be especially close substitutes, nor would

[84] *Id.* ¶¶ 247-249.

[85] *Id.* ¶ 250.

Sprint Nextel be the leading firm in most markets. Rival carriers also appear to have sufficient capacity to absorb a significant number of additional subscribers in the event of an attempted unilateral price increase by Sprint Nextel, even in screen-identified markets in which the Sprint Nextel share is large. The potential for output expansion by rivals will, therefore, deter the merged firm from raising prices. Taken together with the efficiencies that the merger is expected to produce, these factors make unilateral price increases unlikely.

157. Similarly, based on our analysis to date, we conclude that there is little concern that the merger could increase the likelihood of coordination among the leading firms. Pricing to enterprise customers does not appear to be transparent. There are now, and will remain, substantial asymmetries among wireless carriers, including the fact that only some carriers are affiliated with ILECs and the fact that the carriers are situated differently on their technology paths. Moreover, there appears to be sufficient capacity to discipline attempts to coordinate price increases by the two leading firms in a market. Given these factors and the expected efficiencies, coordinated price increases also seem unlikely. Closer examination of those few markets where the SAC is inadequate suggests that even in these markets, the merger is not likely to lead to pricing coordination. Moreover, the merger will not decrease intermodal competition and more likely will increase it by permitting Sprint Nextel to become more efficient.

APPENDIX 1

STANLEY M. BESEN—Vice President

Ph.D.	Economics, Yale University
M.A.	Economics, Yale University
B.B.A.	Economics, City College of New York

Dr. Besen is a Vice President in CRA's Economic Litigation Program.

PROFESSIONAL EXPERIENCE

1992–present	*Vice President*, Charles River Associates, Washington, DC.
1980–1992	*Senior Economist*, The RAND Corporation, Washington, DC.
1990–1991	*Visiting Professor of Law and Economics*, Georgetown University Law Center.
1988–1989	*Visiting Henley Professor of Law and Business*, Columbia University.
1985–1988	*Co-editor, RAND Journal of Economics*.
1978–1980	*Co-director*, Network Inquiry Special Staff, Federal Communications Commission.
1971–1972	*Brookings Economic Policy Fellow*, Office of Telecommunications Policy, Executive Office of the President.
1965–1980	*Assistant Professor, Associate Professor, Professor of Economics, Allyn R. and Gladys M. Cline Professor of Economics and Finance*, Rice University.
1963–1965	*Economist*, Institute for Defense Analyses.
1962–1963	*Acting Assistant Professor of Economics*, University of California, Santa Barbara.

CONSULTANCIES

1972–1978	The RAND Corporation
1972–1977	Office of Telecommunications Policy, Executive Office of the President
1975	Texoma Regional Planning Commission
1967	Department of Defense

PROFESSIONAL ACTIVITIES/HONORS

Member, National Research Council Board on Earth Sciences and Resources, Division on Earth and Life Studies, Committee on Licensing Geographic Data and Services, 2002–2004

Member, The National Academies Computer Science and Telecommunications Board Committee on Internet Searching and the Domain Name System, 2001–2004

Member, Editorial Board, *Information Economics and Policy*, 1992–2004

Member, Editorial Board, *Economics of Innovation and New Technology*, 1989–present

Member, U.S. National Committee on Data for Science and Technology (CODATA), National Academy of Sciences/National Research Council, 1993–1996

Member, Office of Technology Assessment Advisory Panel on Communications Systems for an Information Age, 1986-1988

Member, Regional Telecommunications Planning Advisory Committee, City of Cincinnati, 1985

Member, Office of Technology Assessment Advisory Panel on Intellectual Property Rights in an Age of Electronics and Information, 1984-1985

Expert, World Intellectual Property Organization/UNESCO Meeting on Unauthorized Private Copying of Recordings, Broadcasts and Printed Matter, 1984

Listed in *Who's Who in America*, 1982-1983, 1984-1985, 1986-1987, 1988-1989, 1990-1991, 1992-1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005

Member, Editorial Board, *Southern Economic Journal*, 1979-1981

Member, Task Force on National Telecommunications Policy Making, Aspen Institute Program on Communications and Society, 1977

Brookings Economic Policy Fellow, 1971-1972

Member, Technical Advisory Committee on Business Development, Model City Program, City of Houston, 1969-1971

Wilson University Fellow, 1959-1961

Overbrook Fellow, 1958-1959

Beta Gamma Sigma, 1958

PUBLICATIONS

Books and Reports

Telecommunications and Information Technology Standardization in Japan: A Preliminary Survey. The RAND Corporation, N-3204-CUSJR, 1991.

Compensating Creators of Intellectual Property: Collectives that Collect. With S. Kirby. The RAND Corporation, R-3751-MF, 1989.

New Technologies and Intellectual Property: An Economic Analysis. The RAND Corporation, N-2601-NSF, 1987.

Compatibility Standards, Competition, and Innovation in the Broadcasting Industry. With L. Johnson. The RAND Corporation, R-3453-NSF, 1986.

The Economics of Bulk Power Exchanges. With J. Acton. The RAND Corporation, N-2277-DOE, 1985.

Misregulating Television: Network Dominance and the FCC. With T. Krattenmaker, A. Metzger, and J. Woodbury. Chicago: University of Chicago Press, 1984.

An Analysis of the Federal Communication Commission's Group Ownership Rules. With L. Johnson. The RAND Corporation, N-2097-MF, 1984.

Regulation of Media Ownership by the Federal Communications Commission: An Assessment. With L. Johnson. The RAND Corporation, R-3206-MF, 1984.

Issues in the Design of a Market Experiment for Bulk Electrical Power. With J. Acton. The RAND Corporation, N-2029-DOE, 1983.

An Economic Analysis of Mandatory Leased Channel Access for Cable Television. With L. Johnson. The RAND Corporation, R-2989-MF, 1982.

After Energy Price Decontrol: The Role of Government Conservation Programs. With L. Johnson. The RAND Corporation, N-1903-DOE, 1982.

Cable Copyright and Consumer Welfare: The Hidden Cost of the Compulsory License. With H. Shooshan, C. Jackson, and J. Wilson. Shooshan and Jackson, 1981.

New Television Networks: Entry, Jurisdiction, Ownership, and Regulation. With T. Krattenmaker et al. Final Report, Network Inquiry Special Staff, Federal Communications Commission, 1980.

Economic Policy Research on Cable Television: Assessing the Costs and Benefits of Cable Deregulation. With B.M. Mitchell, R.G. Noll, B.M. Owen, R.E. Park, and J.N. Rosse. Prepared for the Office of Telecommunications Policy, Executive Office of the President, December 1976. Reprinted in P. MacAvoy (ed.), *Deregulation of Cable Television*, American Enterprise Institute, 1977.

On Measuring the Gain in Economic Welfare from Marginal Cost Pricing when a Related Market Is of Importance: The Case of Electricity and Natural Gas. With B. Mitchell. The RAND Corporation, P-5755, 1977.

"A Simultaneous Equations Model of Television Station Revenue and Expenditure." Appendix F to R. Park, L. Johnson, and B. Fishman, *Projecting the Growth of Television Broadcasting: Implications for Spectrum Use*. The RAND Corporation, R-1841-FCC, 1976.

Introduction to Monetary Economics. Harper and Row, 1975.

An Economic Evaluation of an Alternative Method of Funding Public Broadcasting. Broadcasting Institute of North America, 1973.

Evaluating the Returns to Regional Economic Development Programs. Institute for Defense Analyses, B-272, 1966.

Internal Prices as an Administrative Tool: An Application to the Military Air Transport Service. With M. Bailey, J. Cross, and W. Sewell. Institute for Defense Analyses, S-200, 1965.

Articles and Book Chapters

"Evaluating the Competitive Effects of Mergers of Internet Backbone Providers." *ACM Transactions on Internet Technology*," (with J.S. Spigel and P. Srinagesh), 2002.

"Advances in Routing Technologies and Internet Peering Agreements." *American Economic Association Papers and Proceedings*, (with P. Milgrom, B.M. Mitchell, and P. Srinagesh), 2001.

"Intellectual Property." In *The New Palgrave Dictionary of Economics and the Law*, The Macmillan Press, 1998. Reprinted in R. Towse and R.W. Holzhauer (eds.), *The Economics of Intellectual Property*, Edward Elgar, 2001.

"Analyzing Vertical and Horizontal Cross Ownership in Cable Television: the Time Warner-Turner Merger (1996)." In J.E. Kwoka and L.J. White, *The Antitrust Revolution: Economics, Competition, and Policy*, Third Edition, Scott, Foresman, (with E. Murdoch, D. O'Brien, S. Salop and J. Woodbury), 1998.

"Telecommunications in the U.S.A: Evolution to Pluralism." In B. Lange (ed.), *ISDN: An International Comparison of Trends in the USA, Japan, Singapore and Europe*, Final Report to the ISDN Commission of North Rhine-Westphalia, (with S.R. Brenner and J.R. Woodbury), 1996.

"The Standards Processes in Telecommunications and Information Technology." In R. Hawkins, R. Mansell and J. Skea (eds.), *Standards, Innovation, and Competitiveness: The Politics and Economics of Standards in Natural and Technical Environments*, Edward Elgar, 1995.

"Rate Regulation, Effective Competition, and the Cable Act of 1992." *Hastings Communications and Entertainment Law Journal*, (with J.R. Woodbury), 1994.

"Choosing How to Compete: Strategies and Tactics in Standardization." *Journal of Economic Perspectives*, (with J. Farrell), 1994.

"AM v. FM: The Battle of the Bands." *Industrial and Corporate Change*, 1992.

"An Economic Analysis of Copyright Collectives." *Virginia Law Review*, (with S. Kirby and S. Salop), 1992.

"The Role of the ITU in Telecommunications Standardization: Pre-Eminence, Impotence, or Rubber Stamp?" *Telecommunications Policy*, (with J. Farrell), 1991. Reprinted as The RAND Corporation, RP-100, 1992.

"An Introduction to the Law and Economics of Intellectual Property." *Journal of Economic Perspectives*, (with L. Raskind), 1991. Translated and reprinted as "Introduzione agli Aspetti Legislativi ed Economici della Proprieta Intellettuale," in G. Goisis (ed.), *Efficienza Produttiva: Alcuni Contributi Su Noti (E Meno Noti) Argomenti*, CEDAM, 1994; reprinted in K.E. Maskus (editor), *The WTO, Intellectual Property Rights and the Knowledge Economy*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing, 2004.

"The European Telecommunications Standards Institute: A Preliminary Analysis." *Telecommunications Policy*, 1990. Reprinted as The RAND Corporation, N-3320-NSF, 1991.

"Separate Satellite Systems and INTELSAT: An American View." *Revue de Droit de l'Informatique et des Telecoms*, 1989.

"The Economics of Telecommunications Standards." In R. Crandall and K. Flamm (eds.), *Changing the Rules: Technological Change, International Competition, and Regulation in Communications*, Brookings Institution, (with G. Saloner), 1989. Reprinted as "Compatibility Standards and the Market for Telecommunications Services," in T.J. Allen and M.S. Scott Morton (eds.), *Information Technology and the Corporation of the 1990s*, Oxford University Press, 1994.

"Private Copying, Appropriability, and Optimal Copying Royalties." *Journal of Law and Economics*, (with S. Kirby), October 1989. An earlier version appeared as The RAND Corporation, R-3546-NSF, 1987.

"Assessing the Effects of Bulk Power Rate Regulation: Results from a Market Experiment." *Applied Economics* (with J. Acton), May 1987. Reprinted in J. Plummer and S. Troopman (eds.), *Competition in Electricity: New Markets and New Structures* (Public Utilities Reports and QED Research, 1990). An earlier and more extended version appeared as *Regulation, Efficiency, and Competition in the Exchange of Electricity: First-Year Results from the FERC Bulk Power Market Experiment* (The RAND Corporation, R-3301-DOE, 1985).

"Discussion of Michael A. Tyler, 'The Extent of Software Piracy.'" In F. Huband and R. Shelton (eds.), *Protection of Computer Systems and Software*. Clifton, NJ: Law & Business, Inc., 1986.

"Private Copying, Reproduction Costs, and the Supply of Intellectual Property." *Information Economics and Policy*, 1986. Reprinted in D. Lamberton (ed.), *The Economics of Communication and Information*, Edward Elgar, 1996. An earlier version appeared as The RAND Corporation, N-2207-NSF, 1984.

"Copying Costs and the Costs of Copying." In M. Greenberger (ed.), *Electronic Publishing Plus: Media for a Technological Future*. Knowledge Industries, 1985.

"Regulation of Broadcast Station Ownership: Evidence and Theory." in E. Noam (ed.), *Video Media Competition: Regulation, Economics, and Technology*, Columbia University Press, (with L. Johnson), 1985.

"The Regulation of Telecommunications Networks." *Information Society*, 1984.

"The Determinants of Network Television Program Prices: Implicit Contracts, Regulation, and Bargaining Power." *The Bell Journal of Economics, (*with J. Woodbury and G. Fournier), 1983.

"Regulation, Deregulation, and Antitrust in the Telecommunications Industry." *The Antitrust Bulletin*, (with J.Woodbury), 1983.

Summary Comments in E. Noam (ed.), *Telecommunications Regulation Today and Tomorrow*. Law & Business, Inc./Harcourt Brace Jovanovich, 1983.

"Economic Implications of Mandated Efficiency Standards for Household Appliances: Comment." *The Energy Journal*, (with L. Johnson), 1982.

"Regulating Network Television: Dubious Premises and Doubtful Solutions." *Regulation*, (with T. Krattenmaker), 1981.

"The Deregulation of Cable Television." *Law and Contemporary Problems*, (with R. Crandall), 1981.

"An Analysis of the Network-Affiliate Relationship in Television." Network Inquiry Special Staff, Federal Communications Commission, (with S. Preskill), 1980.

"The Value of Television Time: Some Problems and Attempted Solutions: Reply." *Southern Economic Journal*, 1978.

"Copyright Liability for Cable Television: Compulsory Licensing and the Coase Theorem." *Journal of Law and Economics*, (with W. Manning and B. Mitchell), April 1978. Reprinted in R. Towse and R.W. Holzhauer (eds.), *The Economics of Intellectual Property*, Edward Elgar, 2001. An earlier version appeared as "Copyright Liability for Cable Television: Is Compulsory Licensing the Solution?" The RAND Corporation, R-2023-MF, 1977.

"Deregulating Telecommunications — Sorting Out Mixed Signals." *Regulation*, 1978.

"The Value of Television Time." *Southern Economic Journal*, January 1976. An earlier version appeared as "The Value of Television Time and the Prospects for New Stations," The RAND Corporation, R-1328-MF, 1973.

"Watergate and Television: An Economic Analysis." *Communications Research*, July 1976. An earlier version appeared as The RAND Corporation, R-1712-MF, 1975.

"Market Size, VHF Allocations, and the Viability of Television Stations." *Journal of Industrial Economics*, (with P. Hanley), 1975.

"The Economics of the Network-Affiliate Relationship: Reply." *American Economic Review*, (with R. Soligo), 1975.

"The Economics of the Cable Television 'Consensus.'" *Journal of Law and Economics*, 1974.

"Education and Productivity in United States Manufacturing: Some Cross-Section Evidence." *Journal of Political Economy*, 1973.

"The Economics of the Network-Affiliate Relationship in the Television Broadcasting Industry." *American Economic Review*, (with R. Soligo), 1973.

"Elasticities of Substitution and Returns to Scale in United States Manufacturing: Some Additional Evidence." *Southern Economic Journal*, 1967.

"Cost Effectiveness Analysis for the 'War on Poverty.'" in T. Goldman (ed.), *Cost-Effectiveness Analysis: New Approaches in Decision-Making*. New York: Praeger, (with A. Fechter and A. Fisher), 1967.

"An Empirical Analysis of Commercial Bank Lending Behavior." *Yale Economic Essays*, 1965.

CONGRESSIONAL TESTIMONY

Witness, Subcommittee on Intellectual Property and Judicial Administration, Committee on the Judiciary, US House of Representatives, 1991. Prepared statement and testimony appear in *Intellectual Property and International Issues*, 102nd Congress, 1st Session.

Witness, Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce, US House of Representatives, 1990. Prepared statement and testimony appear in *Cable Television Regulation (Part 2)*, 101st Congress, 2nd Session.

Witness, Subcommittee on Telecommunications, Consumer Protection, and Finance, Committee on Energy and Commerce, US House of Representatives, 1983. Prepared statement and testimony appear in *Options for Cable Legislation*, 98th Congress, 1st Session.

Witness, Subcommittee on Communications, Committee on Commerce, Science, and Transportation, US Senate, 1982. Prepared statement and testimony appear in *Cable Television Regulation*, 97th Congress, 2nd Session.

Witness, Subcommittee on Telecommunications, Consumer Protection, and Finance, Committee on Energy and Commerce, US House of Representatives, 1981. Prepared statement and testimony appear in *Status of Competition and Deregulation in the Telecommunications Industry*, 97th Congress, 1st Session.

Witness, Subcommittee on General Oversight and Minority Enterprise, Committee on Small Business, US House of Representatives, 1980. Prepared statement and testimony appear in *Media Concentration (Part 1)*, 96th Congress, 2nd Session.

Witness, Subcommittee on Communications, Committee on Commerce, Science, and Transportation, US Senate, 1977. Prepared statement and testimony appear in *Cable Television*, 95th Congress, 1st Session.

Witness, Subcommittee on Communications, Committee on Interstate and Foreign Commerce, US House of Representatives, 1976. Prepared statement and testimony appear in *Cable Television Regulation Oversight (Part 1)*, 94th Congress, 2nd Session.

STEVEN C. SALOP—Senior Consultant

Ph.D.	Economics, Yale University
M.Phil.	Economics, Yale University
B.A.	Economics, University of Pennsylvania

FIELDS OF SPECIALIZATION

Industrial Organization
Competition and Antitrust Policy
Economics of Information
Law and Economics

EMPLOYMENT EXPERIENCE

***Current Position*: Professor of Economics and Law, Georgetown University Law Center (at GULC since August 1981).**

Guest Scholar, Brookings Institution, 1990–1991.

Visiting Professor, Massachusetts Institute of Technology, Spring 1986.

Visiting Interdisciplinary Professor, Georgetown University Law Center, July 1981–June 1982.

Associate Director for Special Projects, Bureau of Economics, Federal Trade Commission, January 1980–June 1981.

Assistant Director for Industry Analysis, Bureau of Economics, Federal Trade Commission, September 1979–January 1980.

Deputy Assistant Director for Consumer Protection, Bureau of Economics, Federal Trade Commission, December 1978–September 1979.

Economist, Division of Consumer Protection, Bureau of Economics, Federal Trade Commission, July 1978–December 1978.

Economist, Office of Economic Analysis, Civil Aeronautics Board, September 1977–July 1978.

Economist, Federal Reserve Board, July 1972–September 1977.

Adjunct Professor, Department of Economics, University of Pennsylvania, September 1977– June 1978.

Adjunct Professor, Department of Economics, George Washington University, September 1975–January 1978.

SELECTED PROFESSIONAL ACTIVITIES

Consultant, FTC Joint Venture Project (1999).

Advisory Committee, FTC Hearings on Global and Innovation-Based Competition (1996).

Associate Editor (Industrial Organization), *Journal of Economic Perspectives* (1987–1993).

American Bar Association Antitrust Task Force on Second Requests (1990).

Advisory Board, Georgetown Project on Treble Damages (1986–1987).

Associate Editor, *Journal of Industrial Economics* (1983–1988).

Associate Editor, *International Journal of Industrial Organization* (1984–1989).

Secretary, Antitrust Section, American Association of Law Schools (1983–1984).

Memberships: American Economic Association, American Bar Association, Phi Beta Kappa.

Nominating Committee: American Economic Association, 1982.

Economics Editorial Advisor, *Journal of Consumer Research*, 1982.

OTHER ACTIVITIES

Board of Directors, Charles River Associates Incorporated.

Management Advisory Committee, La Leche League International (1994–1999).

Board of Trustees, The Lowell School (1989–1995).

HONORS AND AWARDS

NSF Graduate Fellowship, 1968–1972.

Graduated *summa cum laude*, with Honors in Economics, from the University of Pennsylvania, 1968.

Schoenbaum Prize in Economics, University of Pennsylvania, 1968.

PUBLICATIONS

Books and Reports

Strategy, Predation, and Antitrust Analysis. (Editor.) Federal Trade Commission, 1981.

Consumer Post-Purchase Remedies. With J. Howard Beales et al. Federal Trade Commission Staff Report, 1980.

Consumer Information Remedies. With Lawrence Kantor et al. Federal Trade Commission Staff Report, 1979.

Articles

"A Few Righteous Men: Imperfect Information, Quit-for-Tat and Critical Mass in the Dynamics of Cooperation." Festschrift in Honor of Joseph E. Stiglitz (2003) (Forthcoming). With Serge Moresi.

"Chicago & Post-Chicago Antitrust: Issues for Discussion." Canadian Bar Association (Annual Fall Conference on Competition Law), 2002.

"Should Concentration Be Dropped From the Merger Guidelines." With Jon Baker. Symposium on Antitrust Analysis of Mergers: Merger Guidelines vs. Five Forces, University of West Los Angeles Law Review, 2001.

"Analysis of Foreclosure in the EC Guidelines on Vertical Restraints." International Antitrust Law & Policy, Annual Proceedings 2000, Fordham University School of Law, 2001.

"The Flawed Fragmentation Critique of Structural Remedies in the Microsoft Case." With R. Craig Romaine and Robert Levinson. *Antitrust Bulletin*, 2001.

"The First Principles Approach, Kodak and Antitrust at the Millennium." *Antitrust Law Journal*, 2000.

"Competitive Analysis of Partial Ownership: Financial Interest and Corporate Control." With Daniel O'Brien. *Antitrust Law Journal*, 2000.

"The Competitive Effects of Passive Minority Equity Interests: Reply," With Daniel O'Brien. *Antitrust Law Journal*, 2001.

"Preserving Monopoly: Economic Analysis, Legal Standards and Microsoft." With R. Craig Romaine. *George Mason University Law Review*, 1999.

"Decision Theory and Antitrust Rules," With C. Frederick Beckner, III. *Antitrust Law Journal*, 1999.

"Analyzing Vertical and Horizontal Cross Ownership in Cable Television: The Time Warner-Turner Merger." With S. Besen, J. Murdoch, D. O'Brien, and J. Woodbury. In J. Kwoka and L. White (eds.), *The Antitrust Revolution*, 1998.

"Vertical Mergers and Leverage." In *The New Palgrave Dictionary of Law and Economics*, 1998.

"You Keep on Knocking but You Can't Come in: Evaluating Restrictions on Access Rules to Input Joint Ventures." With D. Carlton. *Harvard Journal of Law and Technology*, 1996.

"Evaluating Vertical Mergers: A Post-Chicago Approach." With M. Riordan. *Antitrust Law Journal*, 1995.

"Evaluating Vertical Mergers: Reply to Reiffen and Vita Comment." With M. Riordan. *Antitrust Law Journal,* 1995.

"Exclusionary Vertical Restraints: Has Economics Mattered?" *American Economic Review*, May 1992.

"An Economic Analysis of Copyright Collectives." With S. Besen and S. Kirby. *Virginia Law Review*, 1991.

"Competition Among Complements, and Intra-Network Competition." With N. Economides. *Journal of Industrial Economics*, 1992.

"Rowing Against the Tidewater: A Theory of Voting by Multi-Judge Panels." With D. Post. *Georgetown University Law Review*, 1992.

"Evaluating Network Pricing Self-Regulation." In Guerin-Calvert and Wildman (eds.), *Electronic Services Networks: A Business and Public Policy Challenge of Electronic Shared Networks*, 1991.

"Equilibrium Vertical Foreclosure." With J. Ordover and G. Saloner. *American Economic Review*, 1990.

"Vertical Foreclosure Without Commitment: Reply to Reiffen." With J. Ordover and G. Saloner. *American Economic Review*, 1992.

"Deregulating Self-Regulated Shared ATM Networks." *Economics of Innovation and New Technology*, 1990.

"Monopoly Power and Market Power in Antitrust Law." With T. Krattenmaker and R. Lande. *Georgetown University Law Review*, 1987.

"Analyzing Anticompetitive Exclusion." With T. Krattenmaker. *Antitrust Law Journal*, 1987.

"Cost-Raising Strategies." With D. Scheffman. *Journal of Industrial Economics*, 1987.
"Information, Welfare and Product Diversity." With J. Stiglitz. In Feiwel et al. (eds.), *Arrow and the Foundations of the Theory of Economic Policy*, 1987.

"Antitrust Analysis of Exclusionary Rights: Raising Rivals' Costs to Gain Power Over Price." With T. Krattenmaker. *Yale Law Journal*, December 1986.

"Competition and Cooperation in the Market for Exclusionary Rights." With T. Krattenmaker. *American Economic Review*, May 1986.

"Private Antitrust Litigation: Introduction and Framework." With L. White. *Georgetown University Law Review*, 1986.

"Economics of Private Antitrust Litigation." With L. White. *Antitrust Law Journal*, 1986. Reprinted by the Senate Judiciary Committee.

"Quantifying the Competitive Effects of Production Joint Ventures." With T. Bresnahan. *International Journal of Industrial Organization*, 1986.

"Measuring Ease of Entry." *Antitrust Bulletin*, 1986.

"Firm-Specific Information, Product Differentiation and Industry Equilibrium." With J. Perloff. In Morris et al. (eds.), *Strategic Behavior and Industrial Competition*, 1986.

"Practices that (Credibly) Facilitate Oligopoly Coordination." In Stiglitz et al. (eds.), *New Developments in the Analysis of Market Structure*, 1986.

"Equilibrium with Product Differentiation." With J. Perloff. *Review of Economic Studies,* January 1985.

"A Practical Guide to Merger Analysis." With J. Simons. *Antitrust Bulletin*, Winter 1984.

"A Bidding Model of Special Interest Regulation: Raising Rivals' Costs in a Rent-Seeking Society." With D. Scheffman and W. Schwartz. In *The Political Economy of Regulation: Private Interests in the Regulatory Process*, 1984.

"Judo Economics: Capacity Limitations and Coupon Competition." With J. Gelman. *Bell Journal of Economics*, Autumn 1983.

"Raising Rivals' Cost." With D. Scheffman. *American Economic Review*, May 1983.

"Defects in Disneyland: Quality Control as a Two-Part Tariff." With A. Braverman and J.L. Guasch. *Review of Economic Studies*, January 1983.

"The Theory of Sales: A Simple Model of Equilibrium Price Dispersion with Identical Agents." With J. Stiglitz. *American Economic Review*, December 1982.

"A Framework for Evaluating Consumer Information Regulation." With H. Beales, M. Mazis, and R. Staelin. *Journal of Marketing*, Winter 1981.

"Efficient Regulation of Consumer Information." With H. Beales and R. Craswell. *Journal of Law and Economics*, December 1981.

"Consumer Search and Public Policy." With H. Beales, M. Mazis, and R. Staelin. *Journal of Consumer Research*, June 1981.

"Information Remedies for Consumer Protection." With H. Beales and R. Craswell. *American Economic Review*, Papers and Proceedings, May 1981.

"Introduction." In S.C. Salop (ed.), *Strategy, Predation and Antitrust Analysis*, Federal Trade Commission, 1981.

"Strategic Entry Deterrence." *American Economic Review*, Papers and Proceedings, May 1979.

"Monopolistic Competition with Outside Goods." *Bell Journal*, Spring 1979.

"A Model of the Natural Rate of Unemployment." *American Economic Review*, March 1979.

"Alternative Reservations Contracts." Civil Aeronautics Board, 1978.
"Parables of Information Transmission in Markets." In Mitchell (ed.), *The Effect of Information on Consumer and Market Behavior*, 1978.

"The Noisy Monopolist: Information, Price Dispersion and Price Discrimination." *Review of Economic Studies*, October 1977.

"Bargains and Ripoffs: A Model of Monopolistically Competitive Price Dispersion." With J. Stiglitz. *Review of Economic Studies*, October 1977.

"Self-Selection and Turnover in the Labor Market." With J. Salop. *Quarterly Journal of Economics*, November 1976.

"Information and Monopolistic Competition." *American Economic Review*, Papers and Proceedings, May 1976.

"Wage Differentials in a Dynamic Theory of the Firm." *Journal of Economic Theory,* August 1973.

"Systematic Job Search and Unemployment." *Review of Economic Studies* (April 1973).

Reviews/Comments/Testimony

"Slap Their Wrists? Tie Their Hands? Slice Them Into Pieces? Alternative Remedies for Monopolization in the *Microsoft* Case." *Antitrust*, 1999.

"Efficiencies in Dynamic Merger Analysis." Testimony at FTC Hearings on Global and Innovation-Based Competition (November 1995). A slightly revised version has been published as "Efficiencies in Dynamic Merger Analysis: Summary." With Gary Roberts. *World Competition*, June 1996.

"More Value for the Legal Dollar: A New Look at Attorney-Client Fees and Relationships." With R. Litan. *Judicature*, 1994.

"*Kodak* as Post-Chicago Law and Economics." *CRA Perspectives*, April 1993. Reprinted in Texas Bar Association, *Antitrust and Business Litigation Bulletin*, November 1993.

"Antitrust Goes to College." With Lawrence White. *Journal of Economic Perspectives*, Summer 1991.

"Analysis of Entry in the New Merger Guidelines." *Brookings Papers on Economic Activity*, 1991.

"Mergers and Antitrust." *Journal of Economic Perspectives*, 1987.
"Comment on Golbe and White, 'Time Series Analysis of Mergers.'" In Auerbach et al., *Mergers and Acquisitions*, National Bureau of Economic Research.

"Policy Implications of Conference Papers." In Auerbach et al., *Mergers and Acquisitions*, National Bureau of Economic Research.

"Evaluating Uncertain Evidence with Sir Thomas Bayes." *Journal of Economic Perspectives*, Summer 1987.

"Implications of the Georgetown Project for Treble Damages Reform." Senate Judiciary Committee, March 21, 1986.

"Policing Deceptive Advertising." Serial No. 97-134, 97th Congress.

"Entry Barriers, Consumer Welfare, and Antitrust Reform." In B. Bock et al., *Antitrust and New Views of Microeconomics*. Conference Board, 1986.

"Buy American, Save Your Job?" In J. Tobin et al., *Macroeconomics, Prices, and Quantities*. Brookings Institution, 1983.

"Selling Consumer Information." With H. Beales. In J. Olson et al., *Advances in Consumer Research*, Vol. VII, 1980.

"Comment on R. Schmalensee, 'On the Use of Economic Models in Antitrust.'" In O. Williamson et al., *Antitrust Law and Economics*, 1980.

"Review of K. Lancaster, 'Variety, Equity, and Efficiency,'" *Journal of Economic Literature*, 1980.

JOHN R. WOODBURY—Vice President

Ph.D.	Economics, Washington University (St. Louis)
M.A.	Economics, Washington University (St. Louis)
B.A.	Economics, College of the Holy Cross, *summa cum laude*

Dr. Woodbury's principal fields of expertise are industrial organization, regulation, antitrust, law, and economics. He is an expert in and has published on the economics of antitrust and regulation in broadcasting, cable, telecommunications, and other industries.

PRIOR PROFESSIONAL EXPERIENCE

Microeconomic Consulting and Research Associates, Inc.
(formerly Competitive Analysis Group, ICF Consulting Associates)

Principal, 1989–1992. Responsible for providing antitrust and regulatory advice to clients.

Analysis Group

Research Associate, 1989. Responsible for providing antitrust and regulatory advice to clients.

Federal Trade Commission (1985–1989)

Associate Director for Special Projects, Office of the Bureau Director, Bureau of Economics. Responsible for: initiating, conducting, and reviewing economic studies on Commission and other regulatory policies (including telecommunications); drafting speeches for the Chairman; and reviewing Bureau participation in FTC cases.

Assistant Director for Rulemaking, Division of Policy and Evaluation, Bureau of Consumer Protection. Responsible for managing the Commission's Rulemaking Agenda, and drafting recommendations to the Commission from the Bureau Director. Rules reviewed include Holder-in-Due-Course, Vocational Schools, Cooling-Off, and Funeral Rules.

Deputy Assistant Director, Regulatory Analysis, Bureau of Economics. Responsible for conducting or supervising studies or filings before regulatory agencies, including the Federal Communications Commission, the International Trade Commission, and the National Highway Traffic Safety Administration.

National Cable Television Association

Vice President, Department of Research and Policy Analysis, 1983–1985. Responsible for conduct or supervision of studies related to cable television, including consumer costs of the franchising process, deregulation of cable prices, effects of copyright fees on consumers, and the extent of competition with cable TV.

Federal Trade Commission

Senior Economist, Regulatory Analysis Division, Bureau of Economics, 1982–1983. Responsible for broadcasting and telecommunications.

Federal Communications Commission

Chief, Economics Division, Common Carrier Bureau. 1979–1982. Senior economic advisor to Bureau and Commission on common carrier policy. Directed 25 subordinates in policy analysis.

Industry Economist, Network Inquiry Special Staff. Responsible for the analysis of the program supply industry and the competitive impact of new broadcast technology.

Civil Aeronautics Board

Brookings Economic Policy Fellow assigned to Office of Economic Analysis, 1978–1979. Responsible for the development of merger policy, international aviation policy, and service to small communities. Position: Assistant Chief, Policy Analysis Division.

State University of New York at Albany

Assistant Professor of Economics, 1977–1978.

Federal Reserve Bank of New York

Economist, International Research Department, 1975–1977. Responsible for assessing bank-reported capital flows and exchange-rate movements.

Southern Illinois University—Carbondale

Lecturer, 1974–1975.

PUBLICATIONS

"Analyzing Vertical and Horizontal Cross Ownership in Cable Television: the Time Warner-Turner Merger (1996)," in J.E. Kwoka and L.J. White, *The Antitrust Revolution: Economics, Competition, and Policy,* Scott, Foresman. With S. Besen, E. Murdoch, D. O'Brien, and S. Salop. Third Edition, Oxford University Press, 1999.

"Telecommunications in the US: Evolution to Pluralism." With S. Besen and S. Brenner. In B. Lange (ed.), *ISDN in the USA, Japan, Singapore and Europe*, 1996.

"Market Structure, Program Diversity, and Radio Audience Size." With R. Rogers. *Contemporary Economic Policy* 1996.

"Rate Regulation, Effective Competition, and the Cable Act of 1992." With S. Besen. *Hastings Communications and Entertainment Law Journal,* 1994.

"Assessing Competition and Deregulation in Telecommunications: Some Observations on Methodology." In B. Cole (ed.), *After the Breakup: Assessing the New Post-AT&T Divestiture Era.* New York: Columbia University Press, 1991.

"Deterrence and Justice." With J. Bilmes. *Research in Law and Economics*, 1991.

"The First Amendment, Cable MTV, and the Must-Carry Rule: Towards a Cost-Benefit Analysis." *Proceedings of the Airlie House Conference on Telecommunications*, 1987.

"Video Competition and Consumer Welfare." In E. Noam (ed.), *Proceedings of the Arden House Conference on Video Competition.* New York: Columbia University Press, 1986.

Misregulating Television. With S. Besen, R. Metzger, and T. Krattenmaker. Chicago: University of Chicago Press, 1984.

"Regulation, Deregulation, and Antitrust in Telecommunications." With S. Besen. *Antitrust Bulletin*, Spring 1983.

"Determinants of Network Television Program Prices: Implicit Contracts, Regulation, and Bargaining Power." With S. Besen and G. Fournier. *Bell Journal of Economics,* Autumn 1983.

"Advertising, Price Competition, and Market Structure." With A. Arterburn. *Southern Economic Journal,* January 1981.

"Exchange Rate Stability and Monetary Policy." With B. Putnam. Albany Discussion Paper #95 in *Review of Economics and Business Research,* Winter 1980.

"Capital Market Integration Under Fixed and Floating Exchange Rates: An Empirical Analysis." *Journal of Money, Credit, and Banking,* May 1980.

OTHER COMPLETED RESEARCH

"Empirical Evidence on Efficiencies in the Common Ownership of Broadcast Stations." With K. Anderson. Comments on FCC Proceeding, 1991.

"Do Government-Imposed Ownership Restrictions Inhibit Efficiency?" *Working Paper of the Bureau of Economics*, No. 169, 1988.

"Over-the-Air Television and Cable Prices: An Econometric Inquiry." With M. Bykowsky. Served as basis of FCC decision deregulating cable prices, 1985.

"The Effect of Rate Regulation and Franchise Delay on Program Availability." With D. Koran. Comments on FCC Proceeding, 1985.

"Pricing Flexibility and Consumer Welfare: The Deregulation of Basic Cable Rates." NCTA White Paper, 1984.

"Economic Assessment of the Financial Interest and Syndication Rules." With K. Anderson. Comments on FCC Proceeding, 1983.

"Domestic Fixed Satellite Transponders Sales." Comments on FCC Proceeding, 1982.
An Analysis of Television Program Production, Acquisition, and Distribution. With R. Metzger. Network Inquiry Special Staff, Preliminary Report, Federal Communications Commission, June 1990.

"Production Abroad: Theoretical Considerations and Empirical Analysis." Mimeo, 1978.
"Scale Economies in the Airline Industry: A Survey." Mimeo, 1978.

PRESENTED PAPERS

"Market Structure, Program Diversity, and Radio Audience Size." With R. Rogers. Meetings of the Western Economics Association, July 1993.

"The Effects of Rate Deregulation on Cable Subscribers." With K. Baseman. Policy Approaches to the Deregulation of Network Industries: An American Enterprise Institute Conference, October 1990.

"Economic Analysis and Policy Implications of the Financial Interest and Syndication Rule." Telecommunications Policy Research Conference, Airlie House, October 1990.

"The Design and Evaluation of Competitive Rules Joint Ventures for Mergers and Natural Monopolies." With F. Warren-Boulton. American Economic Association Meetings, December, October 1990.

"Do Media Ownership Restrictions Reduce Economic Efficiency?" Telecommunications Policy Research Conference, Airlie House, November 1989.

"The Conflict Between Spectrum Efficiency and Economic Efficiency." With R. Rogers. Telecommunications Policy Research Conference, Airlie House, November 1989.

"Regulation versus Antitrust." Annenberg Conference: The Divestiture Five Years Later, March 1989.

"Regulating Cable Television." Telecommunications Policy Research Conference, Airlie House, September 1987.

"An Empirical Analysis of Television Program Prices." With S. Besen and G. Fournier. Meetings of the Southern Economic Association, November 1981.

"Flexible Exchange Rates and Market Integration." With B. White. Federal Reserve System Conference on Financial Market Research, June 1979.

"Advertising, Price Competition, Market Structure." With A. Arterburn. Meetings of the Southern Economic Association, November 1978.

"The Effects of Exchange Rate Systems on International Capital Market Integration." With B. White. Federal Reserve System Conference on International Research, November 1977.

OTHER PROFESSIONAL ACTIVITIES

Chair, "Competition between Cable Television and Telephone Companies." Telecommunications Policy Research Conference, September 1991.

Discussant, "Competition and Ownership in the Media." Telecommunications Policy Research Conference, September 1991.

Chair, "Spectrum Management Session." Telecommunications Policy Research Conference, Airlie House, September 1988.

Book Review, *Productivity in the United States* by John Kendrick and Elliot Grossman, *Southern Economic Journal*, April 1981.

Discussant, "Deregulation of Telecommunications." Meetings of the Western Economic Association, July 1981.

Referee, *Southern Economic Journal*, *RAND Journal of Economics*, Harvard University Press.

AWARDS

Award for Excellence in Economics (FTC), 1988.
Competition Advocacy Award (FTC), 1987.
Brookings Economic Policy Fellow, 1978–1979.
SUNY Faculty Research Grant, 1978.
NSF Traineeship, 1973–1974.
Finalist, Woodrow Wilson Fellowship Competition, 1971.

APPENDIX 2

The tables to Appendix 2 have been redacted.